

Western Industry

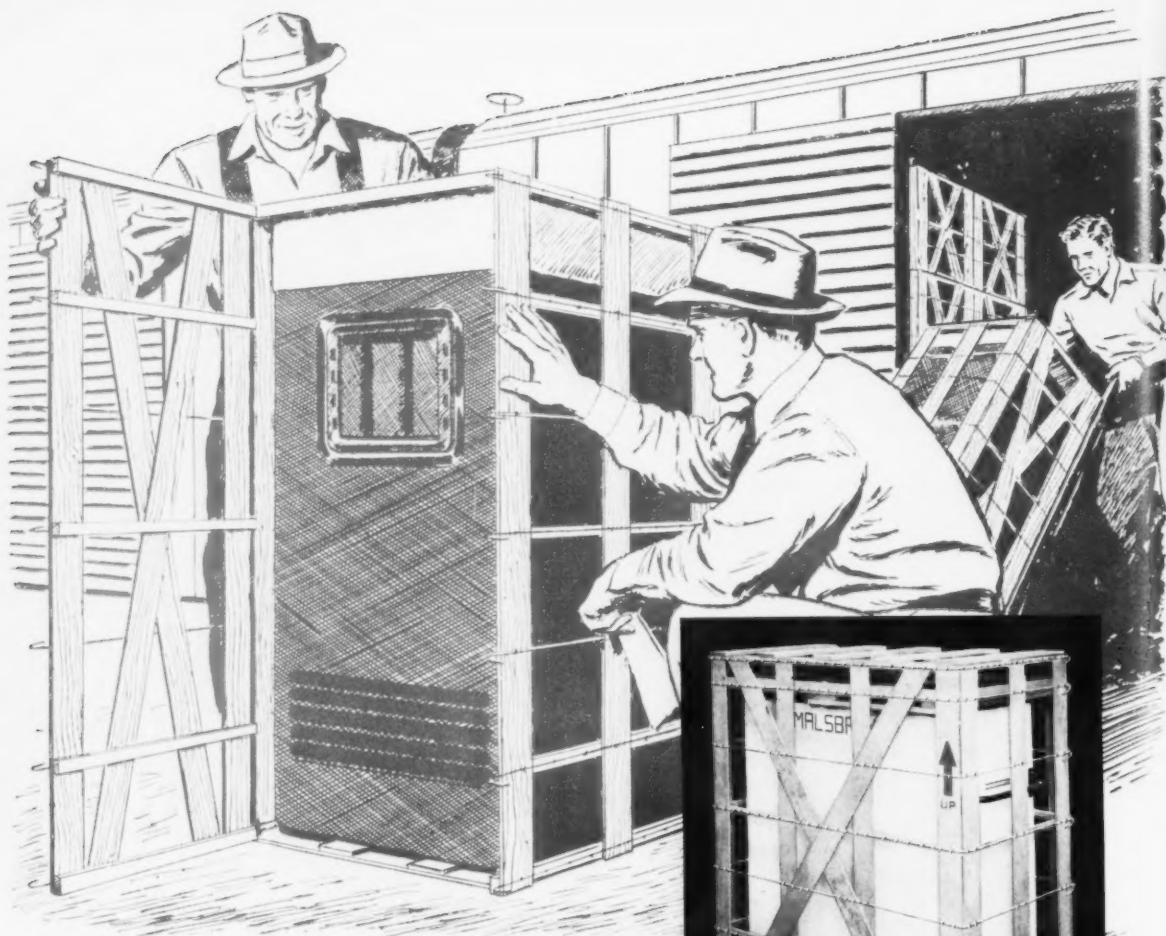
February 1954

*More people in the West . . . More cars
assembled here . . . More assembly plants
. . . see page 30*



COMPARE YOUR ATTITUDES

Automotive fleet a stepchild? Incentive
selling successful? Human relations realistic?



You get more from **CABCO**

Performance... in a shipping container, performance means product protection—result of sound container engineering and careful manufacture. In Cabco containers, the great strength and lightness of Douglas Fir is combined with the natural shock absorbing action of the wirebound design. Each cleat, slat—even spacing of the stout steel wires—is precisely engineered for perfect fit, maximum protection. The outstanding performance of these Cabco wirebounds is another reason why Cabco is the West's foremost manufacturer of wooden shipping containers—and has been since 1883.

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MALSARY MANUFACTURING COMPANY'S Model 110 Steam Cleaner ships as a National Safe Transit Approved unit in custom-designed Cabco wirebound. Wirebound not only delivers the 540 lb. machine undamaged, ready to use; but light, tough container saves 40 lbs. on tare weight, cuts crating time from 45 to 8 minutes. Crate is used for export as well as domestic shipment.

Cabco containers are a product of the California Barrel Company, Ltd., the West's foremost designer and manufacturer of wooden shipping containers

NOW!

BIG

P&H

\$199.50

If you want "Thru-the-Air" handling at its low-cost best, you can't beat this — a *genuine* P&H Zip-Lift Electric Hoist with rope control . . . only \$199.50.

This new "Zip" is built to give you years of trouble-free service — *guaranteed* to withstand an occasional overload up to 25% more than the rated capacity. Other important advantages include real wire rope hoisting for wider side pull, double brakes for double safety, and easy installation (just hang it up and plug it in).

Yes, here's the number-one buy in the low-cost

hoist field — the new Zip-Lift ready to save time and money for you. Check the many ways "Thru-the-Air" handling can cut your *costs*. Ask your nearby P&H Dealer to give your plant the once-over. His advice will cost you nothing — and he will save you money. Call him today!

Also available with full-magnetic push button control

Call your Zip-Lift Dealer
or write for literature.



handle it
"THRU THE AIR"
with



P&H PACIFIC DIVISION
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FEBRUARY 1954

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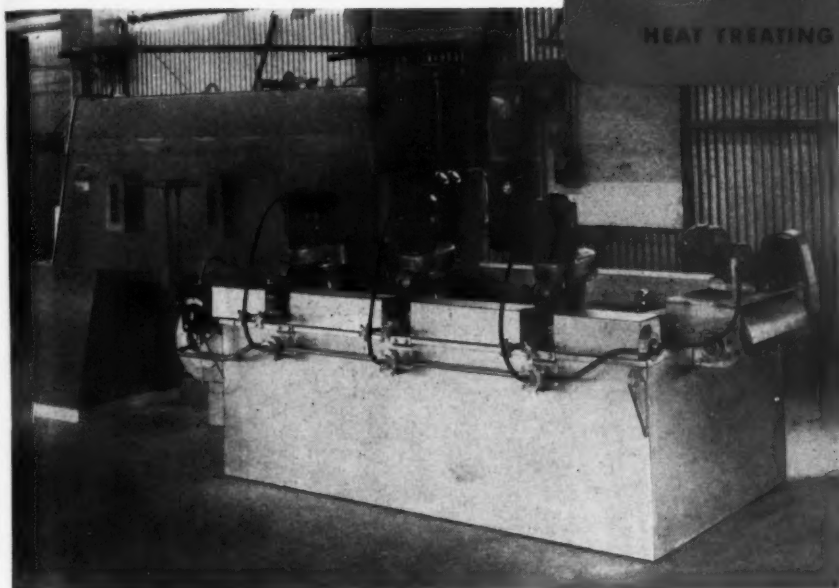
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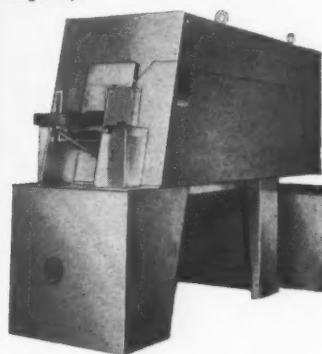
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SERVING ALL INDUSTRY IN THE NATION'S FASTEST GROWING REGION

New ISOTHERMAL QUENCH UNIT



The Isothermal Quench unit and Pacific Shaker Hearth Furnace shown here is in operation in the new plant of Angelus Steel Treating Corp.



FOR MARTEMPERING OR AUSTEMPERING small parts after they go through the Pacific Shaker Hearth Furnace, this quench unit will handle up to 150 lbs. per hour on a production line basis.

The quench unit uses low temperature nitrate salts which are circulated by propeller-type agitators insuring uniform, controlled temperature.

Parts enter the salt quench through a gas-tight chute which is submerged to 3 inches below the salt level, preventing contamination. Parts are distributed over the width of a conveyor belt, which is adjustable for speed to insure proper quench time.

Control is accurate Partlow equipment which automatically regulates an Iris valve which controls the air volume.

Vital Statistics:

SHELL is heavy steel plate, insulated with 2" Superex. Removable salt tank has finned side walls for heat dissipation.

HEATING is by immersion type heaters extending into the salt from the bath surface.

COOLING is by an M.E. type blower, keeping air circulation constant around the salt tank through the fins.

This air is also used to keep the salt molten on the portion of the conveyor belt and parts which are out of the bath, allowing complete salt drainage of the parts before dropping off the belt, eliminating "drag-out".

Pacific SCIENTIFIC CO.

1430 Grande Vista Avenue, Los Angeles, California

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See what adhesives are doing today!



Running rings around assembly costs

Here's another example where comparison proves the advantage of adhesives over mechanical means for fastening.

At Crosley, to complete the assembly of a compressor housing, three operations were required: (1) a weld, (2) positioning of steel lid, (3) shooting the fastening screw. When Crosley switched to the use of a 3M adhesive, EC-847, for this operation, the number of parts needed was reduced, production time was cut down, and savings in assembly costs were realized.

As a matter of fact, today at Crosley, one man (pictured above) performs the entire operation, maintains production of over 1000 pieces in an 8-hour shift.

See what adhesives can do for you . . .

Perhaps 3M adhesives can better perform your fastening operations, too. To check, just call in your local 3M salesman. For a free, informative booklet write to 3M's West Coast Adhesives and Coatings Division Office, Dept. 222, 6411 Randolph St., Los Angeles 54, California.



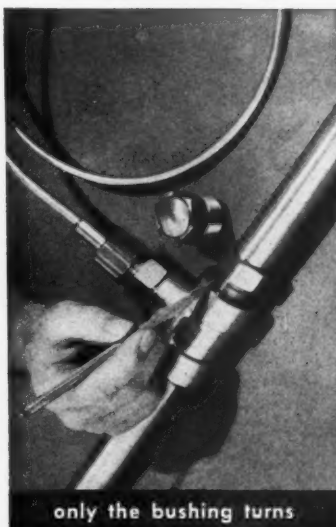
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only the bushing turns

The new compound pressure* cylinder manifold is made of the sturdiest die forgings and extruded rods; all are drilled for uniform inner dimension. The leak proof joint which results from the compound pressure design is tighter and more leakproof even than the well understood and long used connection between regulator and cylinder valve. The big improvement of this new invention lies in these facts: you can have any competent mechanic assemble a cylinder manifold to your own or our specifications with the assurance of absolute alignment and permanent leak proofness. Yet, the resulting cylinder manifold may be disassembled at any time, stored or moved and reassembled when required. It may be extended when needed, redesigned when desired, stored in bins as individual fittings. Only the bushings move in assembly, thus absolute alignment is certain.

*patents applied for

by



threads do it



a very tight seat results



a simple wrench does the job

NATIONAL welding equipment company... 218 fremont street san francisco 5 california

o 10, Calif.

February, 1954—WESTERN INDUSTRY



**GLASS MOVED
QUICKLY FROM
CAR TO SECOND
FLOOR STORAGE**

AT their Houston, Texas, warehouse, Bin-swanger & Company, one of the South's largest distributors of glass, have made the handling of heavy crates of glass from railroad cars to their second floor storage a simple, efficient task by use of an inexpensive Cleveland Tram-rail crane with electric hoist carrier.

The crane runway extends beyond the building, enabling the hoist to be spotted directly above a car. Many hours of time are saved because two men, one on the railroad car and the other on the second floor, can unload a car and place the crates in storage in fast time. The system also saves the cost of a conventional elevator which otherwise would be necessary.



The crane is easily propelled on the runway which extends across the storage room, enabling direct delivery of crates.



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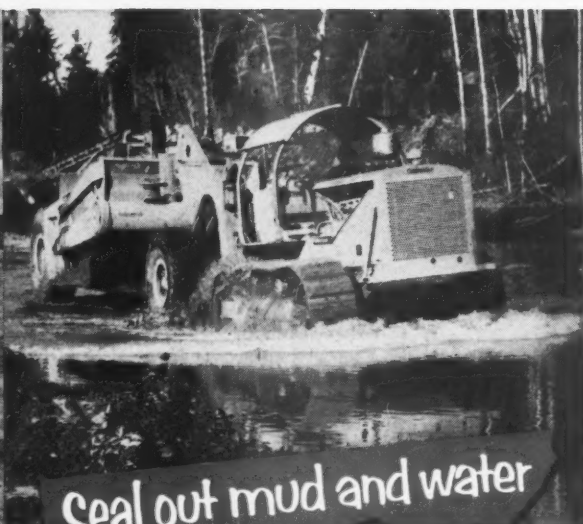
CLEVELAND  TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

For **TOUGH** Sealing Jobs use American Felt!

Seal out dust and grit



Seal out mud and water



Installing a dust seal gasket between the castings in the bevel gear and steering clutch compartment of a Caterpillar track-type Tractor.

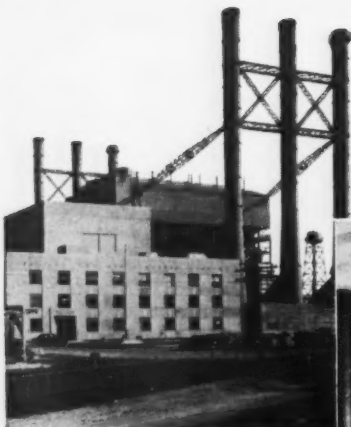
Probably tractors encounter more severe operating conditions than almost any other piece of mechanical equipment, and for that reason it is vitally important to keep dust, grit, and water out of operating parts, and oil and grease in. Felt seals are ideal for this purpose, and American is proud to supply felt for sealing to Caterpillar Tractor Co., Peoria, Illinois. In these days of expanding construction, you will see Caterpillar-built machinery everywhere. Felt is in many of them, unseen, helping protect performance, reliability, and long life . . . American makes various types of felt for sealing purposes, and supplies it as desired, including gaskets and washers cut to size. For information, write for Data Sheet No. 11, "Felt Seals, Their Design and Application."

**American Felt
Company**



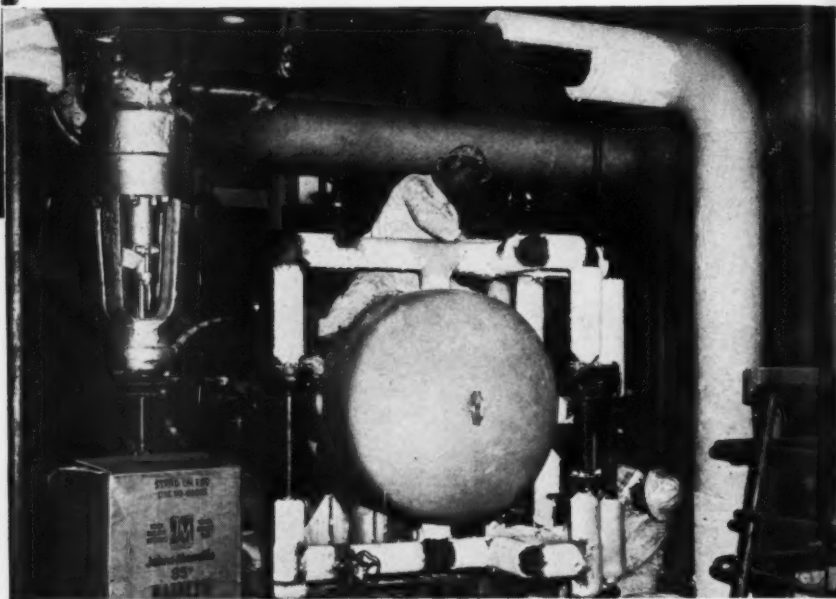
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PACIFIC COAST: A. B. BOYD CO., 1253 Howard St., San Francisco, also 763 E. 14th St., Los Angeles 21, Calif., 733 So. E. Union Ave., Portland 4, Ore., 404 Dexter Ave., Seattle 9, Wash. PLANTS: Glenville, Conn.; Franklin, Mass.; Newburgh, N. Y.; Detroit, Mich.; Westerly, R. I. ENGINEERING AND RESEARCH LABORATORIES: Glenville, Conn.



(Top) Moss Landing, California steam plant of the Pacific Gas and Electric Company, designed by Stone and Webster Engineering Corporation, under the supervision of the P. G. and E. Engineering Dept.

At the new Moss Landing generating plant



(Right) Skilled applicators of an outstanding J-M Insulation Contractor, Western Asbestos Company of San Francisco, applying J-M 85% Magnesia to pipelines during construction of the Moss Landing plant.

P. G. and E. INSULATES WITH SUPEREX-85% MAGNESIA TO LOWER POWER PRODUCTION COSTS

When Pacific Gas and Electric Company invested \$80,000,000 in its new 771,000-horsepower electric generating giant at Moss Landing, California...the insulation, like all other materials, had to meet rigid specifications. *For this important project, Johns-Manville Superex-85% Magnesia double-layer insulation was used on superheated steam pipes.*

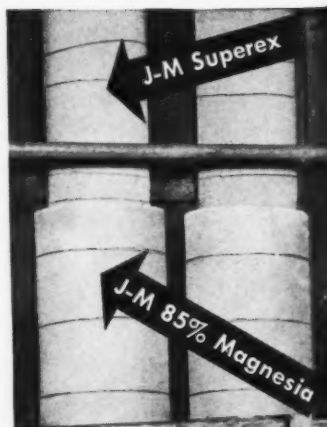
Superex Combination Insulation consists of Superex*, a J-M insulation for temperatures to 1900F, and J-M 85% Magnesia. It was installed at the Moss Landing plant for maximum thermal efficiency and long trouble-free service. This double-layer construction, proved in over a quarter-century of outstanding on-the-job performance, utilizes the higher heat resistance of Superex next to the hot surface—the greater insulation value of J-M 85% Magnesia for the outer layer. It eliminates through joints, protects the jacket against scorching and

is unharmed by expansion encountered in pipes carrying superheated steam.

J-M 85% Magnesia is the leading insulation for temperatures to 600F. It will not distort regardless of its length of service. It fits snug, stays tight. Heat savings, therefore, remain constant for the life of the equipment on which it is applied.

Whatever the insulation—it must be properly engineered and installed to pay maximum dividends. That's why Johns-Manville offers industry the services of experienced J-M Insulation Engineers and J-M Insulation Contractors. These men stand ready to combine their talents and give you an insulation job that will more than pay off your initial investment with maximum fuel savings.

For further information, write Johns-Manville, Box 60, New York 16, N. Y. In Canada, 199 Bay Street, Toronto 1, Ontario.

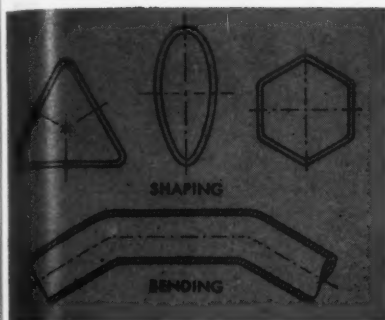


Double-Layer Superex-85% Magnesia Insulation was used on superheated piping at the P. G. and E. Moss Landing plant.

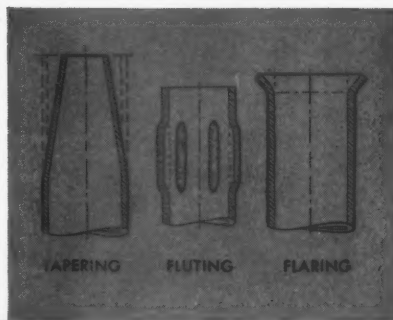
*Reg. U. S. Pat. Off.

Johns-Manville *FIRST IN* INSULATION

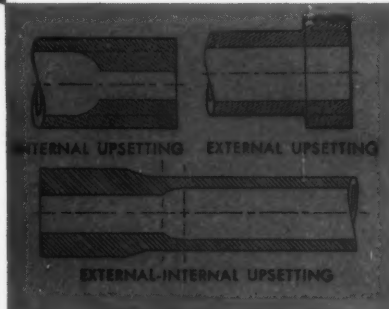
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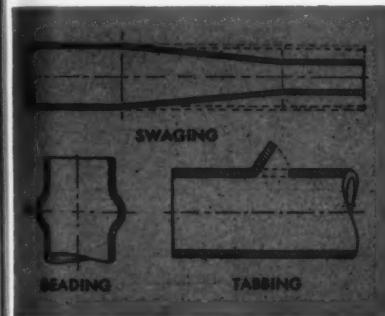
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TUBING
is versatile!



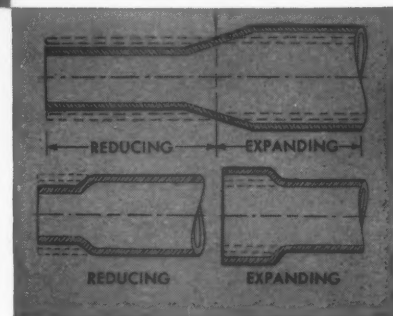
OSTUCO
TUBING
is versatile!



OSTUCO
TUBING
is versatile!



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TUBING
is versatile!



you draw the blueprint... we'll deliver the goods

There's practically no limit to the things OSTUCO can do with Seamless and Electric Welded Steel Tubing to help you produce lighter, stronger, better looking products at lower cost. Only a few of the operations are shown above.

Newly expanded and modernized facilities for *manufacturing, forging, and fabricating* tubing, all in one plant—plus our own steel source as a member of the Copperweld family

—speed deliveries, assure highest quality and save you money.

Tubing is our business, not a side line. OSTUCO's unique "Single Source" operation, with unified production control, eliminates shipments from one location to another . . . greatly reduces rejects . . . prevents errors . . . puts an end to buck passing and red tape. You write one order, get one bill, and responsibility is clearly fixed. Write for informative catalog, "Ostuco Tubing."

OHIO SEAMLESS TUBE DIVISION of Copperweld Steel Company

Manufacturers and Fabricators of Seamless and Electric Welded Steel Tubing
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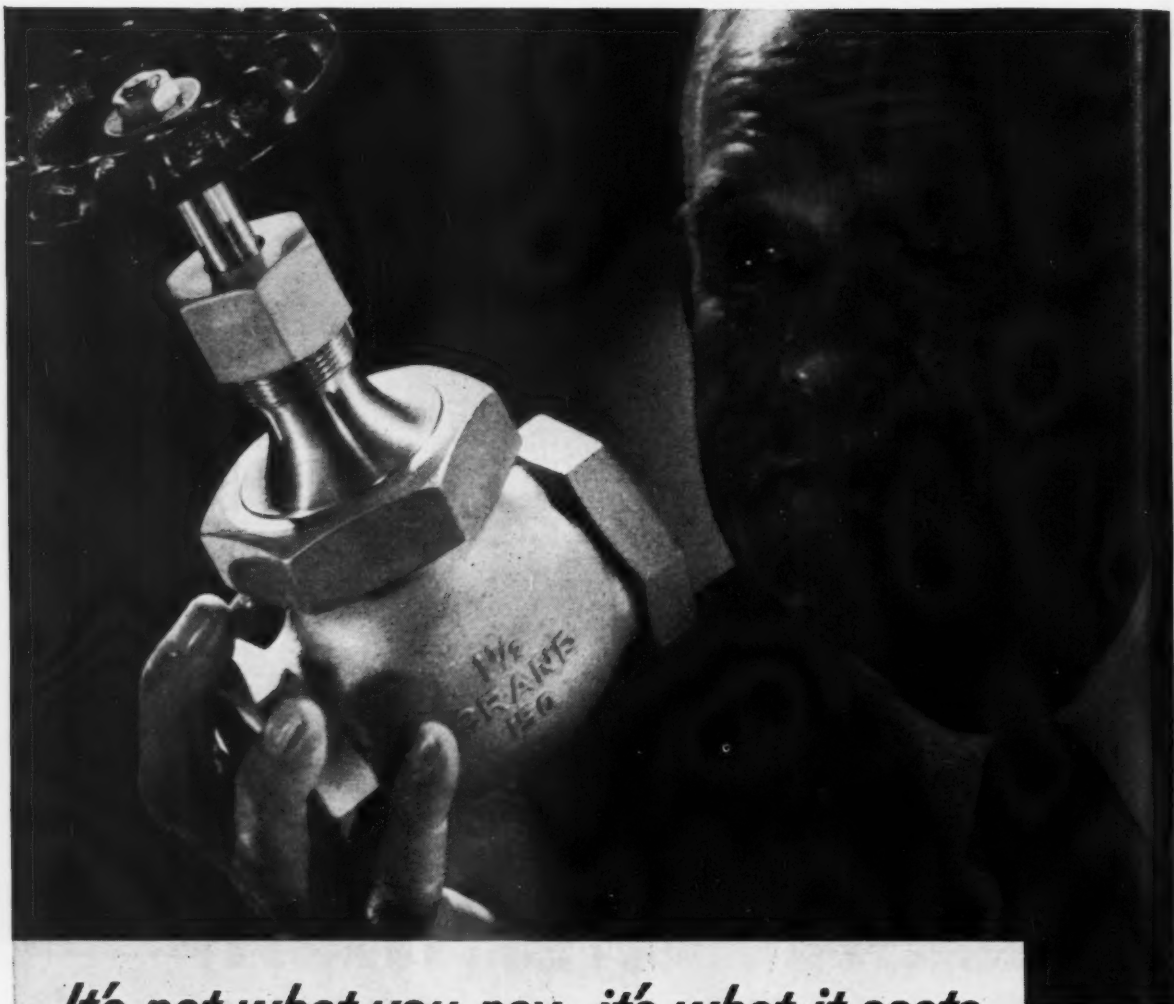


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There probably isn't a thing you buy that you couldn't buy cheaper. Provided, that is, you didn't figure the real cost—provided you weren't concerned with getting your money's worth. Right?

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And it's to you, the thrifty buyer, that we like to sell Crane piping equipment. Whether it's a high pressure, high alloy valve or a ½" malleable pipe fitting, every unit in the Crane line is built to last longer with fewer repairs and lower servicing costs. That's why year in and year out thrifty buyers have put more Crane Valves in service than any other make.

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SEE PROOF OF PERFORMANCE! MAKE
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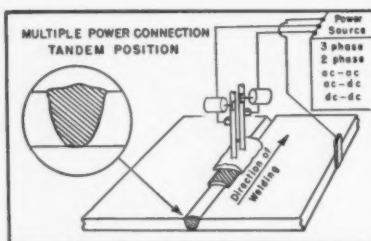
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CUT YOUR WELDING TIME IN HALF *with* UNIONMELT

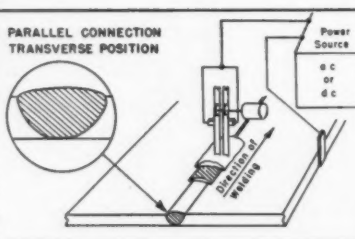
Multiple Electrode Welding

UNIONMELT Multiple Electrode welding with two or more electrodes in tandem, transverse, or other positions increases welding speeds up to three or four times faster than single electrode welding.

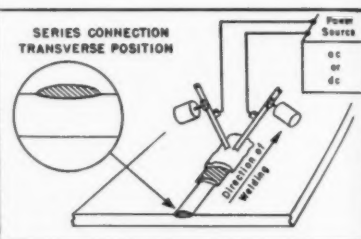
By using two or more electrodes in the same weld zone, magnetic reaction can be regulated to provide exceptional control over arc direction and weld shape.



Extra High-Speed Welds are made with multiple power connection and the electrodes in the tandem position. Speed is three to four times that of single electrode welding. This is particularly suited for welding long continuous seams, well-prepared and well-fitted, as in pipe, tanks, pressure vessels, and structural assemblies.



Extra Wide, High-Speed Welds are made with parallel power connection and the electrodes in the transverse position. Speed is twice as fast as for single electrode work. This is particularly useful for welding seams with gaps or other irregularities, as in center sills, ship plate, and heavy, hard-to-fit work.




Extra Shallow, Wide Welds are made with the series power connection and the electrodes in the transverse position. Speeds are many times faster than single electrode work and the dilution of the deposit is far lower than can be produced with a single electrode. This process will open new possibilities for surfacing and cladding all kinds of articles by automatic welding.

Complete UNIONMELT machines are available for multiple electrode welding and all UNIONMELT apparatus is designed for easy installation in any plant or factory. LINDE's engineers will be glad to

determine how UNIONMELT Multiple Electrode Welding can best benefit you. Call your nearest LINDE office for more details on UNIONMELT Multiple Electrode Welding.

LINDE AIR PRODUCTS COMPANY

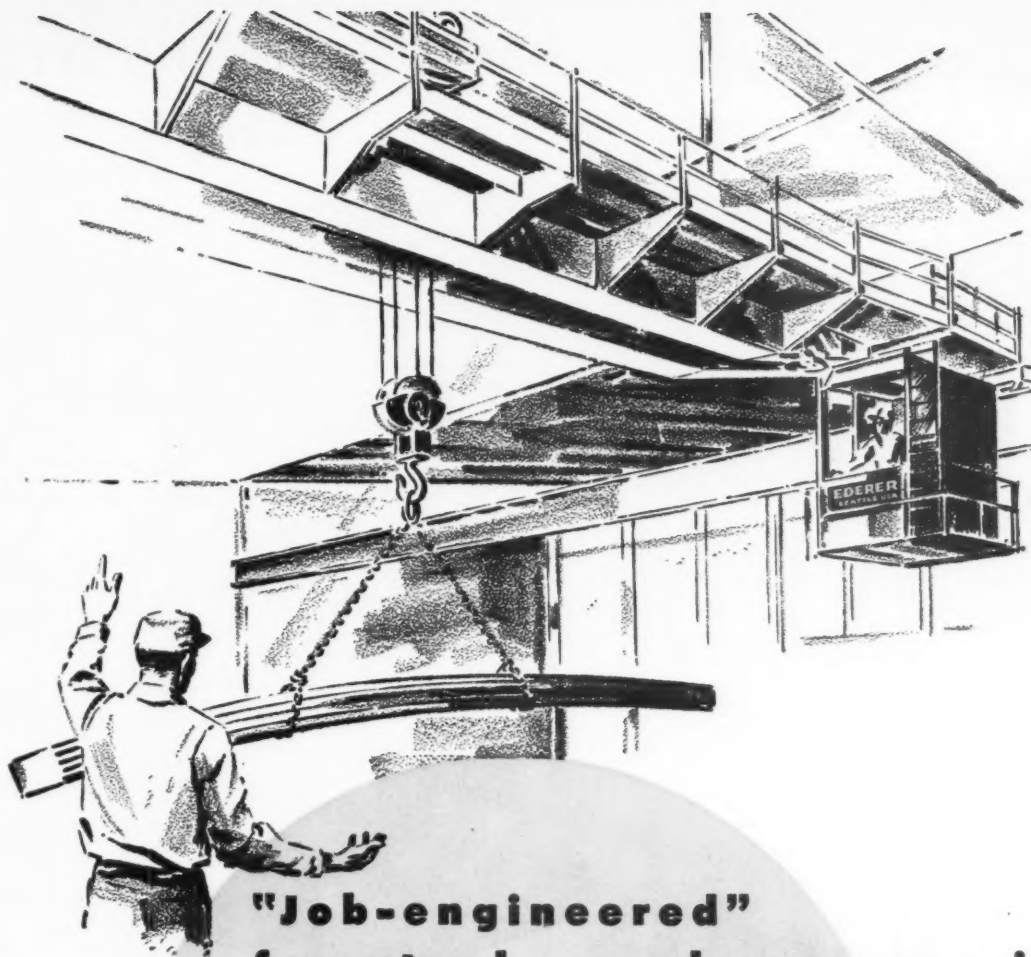
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TRADE-MARK

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"Job-engineered" for steel warehouse service

This EDERER crane moves steel rod in the warehouse of one of the West's largest suppliers of such materials. This type of materials handling calls for rapid, economical operation. EDERER "job-engineered" this single-trolley, 5-ton crane, with 67-foot 5 1/2-inch span, to meet the specific requirements of the job. This crane is typical of hundreds of cranes engineered and built by EDERER to meet exacting job specifications.

Whatever your industry, you have your particular handling requirements. EDERER — one of the largest crane manufacturers in the West — can "job-engineer" a crane to meet them. Delivery can be made to meet your schedule for plant expansion or new construction.

Write for Crane Bulletin CR-500

228CS4

EDERER ENGINEERING COMPANY 2935 First Ave. So. • Seattle 4, Wash.

Export Division: 301 Clay St., San Francisco 11, Calif.

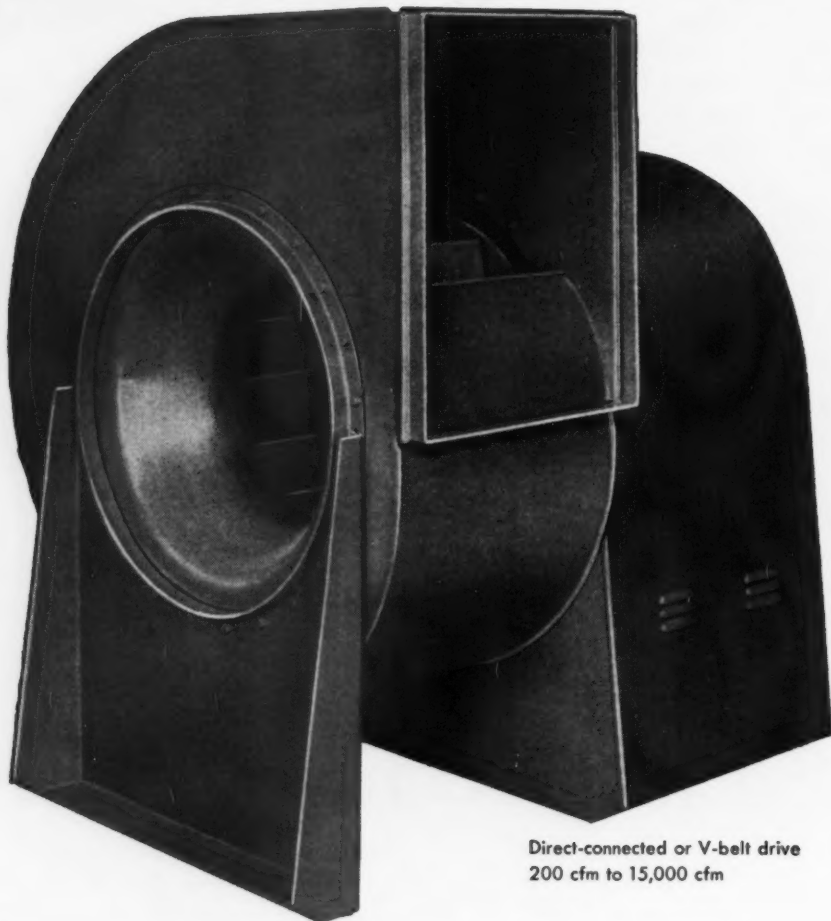
OVER 50 YEARS "JOB-ENGINEERING" CRANES FOR INDUSTRY

EDERER

CRANES

NEW!

ALL-PURPOSE VENTILATING SETS YOU CAN PUT INTO SERVICE FAST!



Direct-connected or V-belt drive
200 cfm to 15,000 cfm

Here's a new line of Westinghouse motor-driven ventilating sets. They are ideal for general purpose ventilation, for exhaust, for processes, and for removal of heat, fumes and vapor.

Where changing plant or building conditions create an unexpected need for ventilation, these sets are a quick solution. Here's why:

COMPACT SIZES—down to 10" x 12" x 16"—take little space, are easy to install.

SINGLE UNIT—fan, motor and drive all made and assembled by Westinghouse.

DIRECTION OF DISCHARGE—can be changed on the job.

LOW MAINTENANCE permits use of out-of-the-way locations.

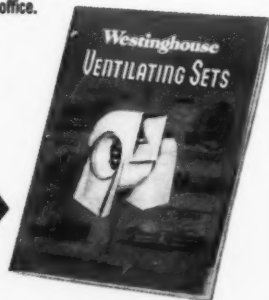
WEATHERPROOF COVERS permit outside installation.

SHORT DELIVERIES get your job started sooner.

These ventilating sets are low in first cost, low in operating cost. You get a single warranty because fan and motor are both built by Westinghouse.

For other exclusive features and full information; ask for Catalog 1160. Call your local Westinghouse-Sturtevant office.

Or, write Westinghouse Electric Corporation, Sturtevant Division, Hyde Park 36, Boston, Massachusetts.



WESTINGHOUSE AIR HANDLING

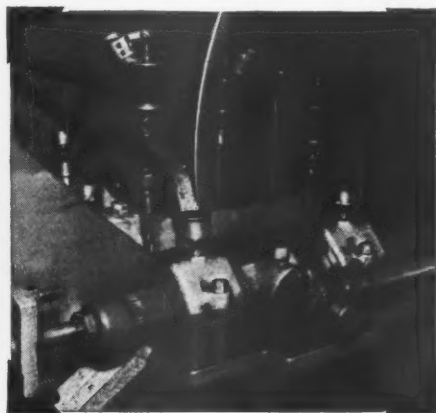
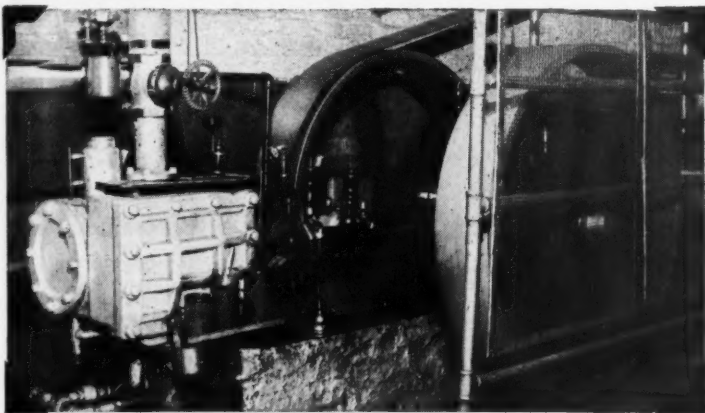
J-80317

YOU CAN BE SURE ... IF IT'S **Westinghouse**

STANDARD ENGINEER'S REPORT

	DATA
LUBRICANT	Calol Red Engine Oil
UNITS	Steam-engine and line-shaft bearings
CONDITIONS	Constant load
PERIOD	10 years
FIRM	Bonner Packing Co., Fresno, Cal.

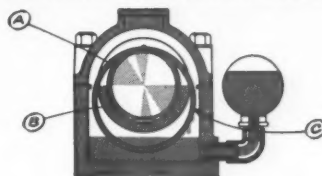
Engine in good condition 10 years after overhaul!



THIS 40-YEAR-OLD STEAM ENGINE, lubricated with Calol Red Engine Oil since its only general overhaul 10 years ago, still runs without apparent loss of power. It operates dried-fruit-processing machinery at the Bonner Packing Company's plant at Fresno, Calif. Line shaft and individual bearings such as the 300-r.p.m. fan bearing at right also get Calol Red Engine Oil. The firm has never lost a bearing since they started using this stable, solvent-refined mineral oil. Calol Red Engine Oils come in several grades, give economical lubrication under tough conditions in many industrial operations. They reduce wear, cut repair costs in your plant.



How CALOL Red Engine Oils cut industrial lubrication costs



- A. Solvent-refined selected mineral oils: Exceptional stability prevents formation of deposits and assures lubrication.
- B. Have low carbon residue and pour tests —provide wide range of application in external lubrication of general industrial machinery.
- C. Pick up well on ring oilers, may be applied by all types of oiling systems.



FREE CATALOG: "How to Save Money on Equipment Operation", a booklet full of valuable information, is ready for you. Write or ask for your free copy today.

TRADEMARK "CALOL" REG. U.S. PAT. OFF.



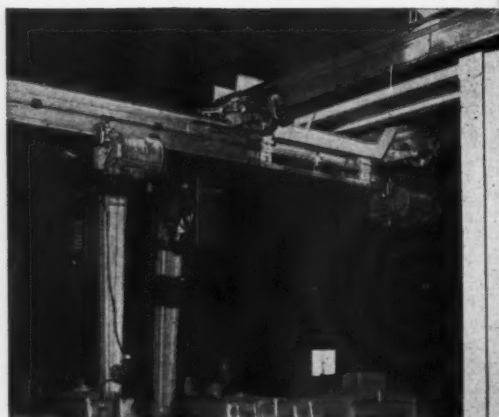
STANDARD TECHNICAL SERVICE checked this product performance. For expert help on lubrication or fuel problems, call your Standard Fuel and Lubricant Engineer or Representative; or write Standard Oil Company of California, 225 Bush St., San Francisco.

STANDARD OIL COMPANY OF CALIFORNIA

for smooth operation at low maintenance cost use.....

AMERICAN MONORAIL CRANES

Three-ton hoist hook service extends from crane way to crane way by finger-tip controlled passage of carrier across crossover with cranes interlocked at each end.



One-ton hoist operated from crane bridge to crane bridge interlocked at crossover between crane ways.

Three MonoRail cranes are interlocked to form passageway for transfer from receiving dock to steel storage area. Crane in foreground interlocks with spur track to each shear.



To handle variable loads over maximum areas, MonoRail Cranes offer smooth travel, easy movement, interlocking service between and beyond crane ways, low initial cost and most

important low maintenance cost. American MonoRail engineers are experienced in all phases of "up and over" handling. They are available for free consultation at your convenience.



AMERICAN

OVERHEAD
HANDLING
EQUIPMENT

MonoRail

 COMPANY

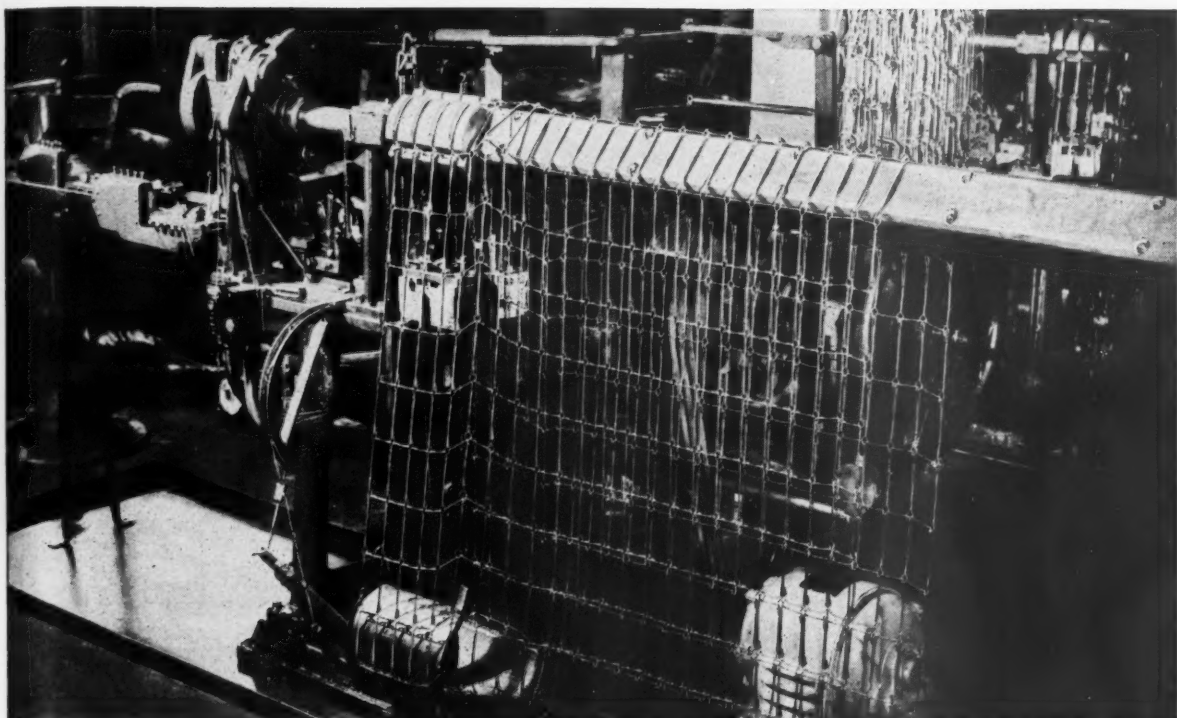
13117 ATHENS AVENUE • CLEVELAND 7, OHIO

Los Angeles, California
American Monorail Co.
4645 Anaheim Telegraph Road

Seattle, Washington
F. T. Crowe Co.
325 Second Avenue

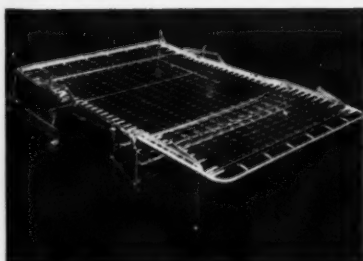
San Francisco, California
Robert M. Taylor Co.
268 Market Street

Portland, Oregon
John S. McMahon
1318 S.W. Alder Street



Production capacity of link fabric machines like this one, was doubled when Metalcraft Products Co., Los Angeles, Calif., switched over to U-S-S Manufacturers Wire. This uniform, high quality wire increased output, made "down time" negligible.

Special wire doubles capacity of link fabric machines!



This Tuckaway bed unit is one of the items, produced by Metalcraft Products Co., using U-S-S Manufacturers Wire. There are more than 1000 types, grades, and finishes of U-S-S Manufacturers Wire available. And, as in this case, Columbia-Geneva also produces tailor-made wire to meet special needs.



Part of the stockpile of high-quality U-S-S Manufacturers Wire used by Metalcraft Products Co. Link fabric is just one of the many uses for U-S-S Manufacturers Wire. Columbia-Geneva, with the greatest wire-making facilities in the West, also produces wire for everything from bolts to bed springs.



Lionel Levinson, (right), General Mgr. of Metalcraft Products Co., examines link fabric with a Columbia-Geneva wire specialist. Mr. Levinson says, "Columbia-Geneva metallurgists developed a wire that completely fulfills our needs. U-S-S Manufacturers Wire has reduced 'down time' to a minimum."

For any forming and fabricating job, rely on U-S-S Manufacturers Wire. Its production is rigidly controlled by United States Steel from raw ore to the finished product. Columbia-Geneva specialists are always available to help you select the wire that's right for your job. For information, write to Columbia-Geneva Steel Division, United States Steel Corporation, 1403 Russ Building, San Francisco 6.

Wire that's tailored to fit your needs



U-S-S Manufacturers Wire

United States Steel Corporation • Columbia-Geneva Steel Division

UNITED STATES STEEL



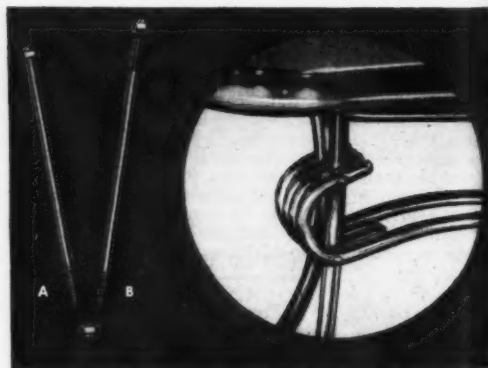
RB&W cold-forming pays off again

Virtue Brothers of Los Angeles sells a lot of these chrome dinette sets. They're good-looking, well-made, easy to keep looking like new.

However, Virtue Brothers believed assembly costs were running high. So they listened hard when an RB&W "fastener engineer" told them RB&W could cut by one-third their cost of buying and installing the steel studs with acorn nuts which hold the table legs together (see inset below).

And we did. By cold-forming an acorn head at one end of the 6-inch stud, RB&W eliminated one of the two separate nuts Virtue had been using. This halved assembly costs, as well as nut inventory. RB&W's cold-formed unit plus assembly runs \$27.15 a thousand as against former costs of \$41.00 a thousand — which works out to more than a pretty penny saved on a production-scale operation.

What an RB&W man did for Virtue Brothers, he can do for you. Because we make all kinds of fasteners, we're always able to recommend and supply the right ones for all your needs. Write RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY, Port Chester, N.Y.



CUSTOMER'S REWARD was a one-third cost reduction when RB&W designed a cold-formed two-piece fastener (A) to replace the three-piece unit (B) formerly employed to secure table legs (right).

.39

RB&W *serves Western industry*
with the complete quality line



WEST COAST PLANT: 4466 Worth St., Los Angeles, Calif. Other plants: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill. Additional sales offices: San Francisco; Dallas; Chicago; Detroit; Pittsburgh; Ardmore (Phila.), Pa.; Sales agents: Portland, Seattle. Distributors from coast to coast.

109 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

for a customer...

AmForge saved \$39,000



This housing for an engine starter weighed too much, cost too much, until AmForge engineers redesigned it with a hole through it.

Admittedly, this case is extreme. But it is an example of the savings that AmForge has been able to find for its customers at its Upset Plant in Chicago. West Coast manufacturers can now obtain similar benefits from AmForge's new facilities at Azusa, California. Backed by more than 50 years of forging experience, this new plant will possess every modern facility for making forgings of the high and uniform quality you demand.

For this engine starter manufacturer, AmForge saved 343 tons of steel worth \$39,000. The original forging required 49 pounds of aircraft quality steel to produce a forging weighing 36½ pounds. Preparatory to final machining it had been bored and faced, a slow operation. After AmForge engineers were through with it, the metal requirement was reduced to 28 pounds, to make a forging weighing 21¼ pounds. Cost of bore and face operations were cut in half. Balance of machining time was cut 10 percent.

To discover how AmForge may help you, send a blueprint, sketch or sample for engineering study—no obligation, of course.

AMERICAN
Brake Shoe
COMPANY

AmForge Division

109 N. WABASH AVENUE, CHICAGO 2, ILLINOIS

PLANTS: AZUSA, CALIFORNIA • CHICAGO, ILLINOIS



COMPLETE FASTENER SERVICE

STANDARDS



SPECIALS

from NATIONAL'S West Coast Plant

With a complete line of standard fasteners . . . including the Phillips Recessed Head types, National's Los Angeles plant is modernly equipped to serve your fastener needs *right on the West Coast*.

If you need "specials", National can help you design almost any kind of special fastener . . . and produce it by cold heading with our extensive production facilities.

You'll save time and money by bringing your fastener problems to us at our Los Angeles plant . . . less than 24 hours shipping time away from your West Coast plant. You can call "National" representatives in San Francisco, Seattle or Denver . . . or contact us direct for your fastener needs.

NATIONAL SCREW & MFG. CO. OF CAL.

3423 So. Garfield Ave., Los Angeles 22, Cal.

Div. of The National Screw & Mfg. Company, Cleveland 4, Ohio



FASTENERS



HOVELL CHAINS



CHESTER HOISTS



want to Save...

- ✓ OPERATING COST?
- ✓ FIRST COST?
- ✓ SPACE?
- ✓ TIME?



HYSTER SALES COMPANY
 2105 S. E. 7th Ave.
 Portland 8, Oregon
 Filmore 6471

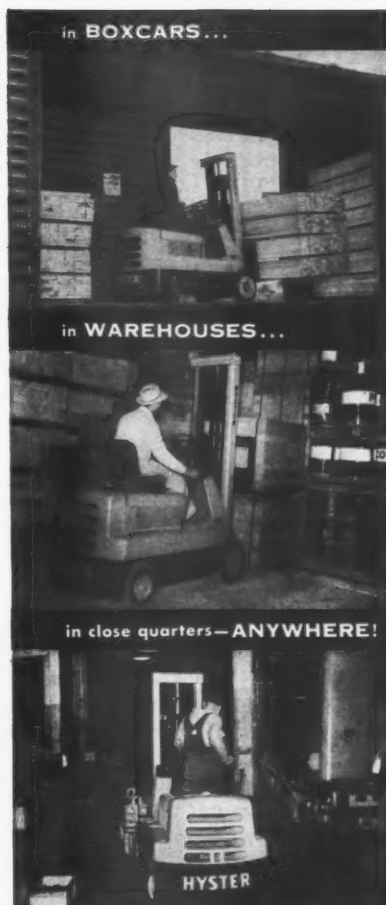


HYSTER COMPANY
 753 9th Ave. North
 Seattle 9, Wash.
 Elliott 2401

HYSTER COMPANY
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 San Francisco 24, Calif.
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THERE'S PROFIT IN
HYSTER
POWER



...take a look at the

HYSTER YC-40 **LIFT TRUCK**

...4000 lbs. capacity—cushion tires

The YC-40 will "snake" your load through the tightest places with corner-hugging maneuverability, to spot the load quickly and accurately—and stack it high to save space. Ability to get more work done, better space utilization, low operating cost, low first cost—plus dependable dealer organizations in every part of the world...all this adds up in the YC-40 to give you the most economical performance of any 4000-lb. lift truck! Call your Hyster Dealer today, or write for Booklet 1241.

Stitch in time saves nine

THE DISLIKE to face inevitable facts and do easily right now the things which will be hard and expensive later on begins when Junior, age 5, gets himself into bad habits by inventing excuses for not doing his chores. Mature individuals and corporations also frequently have that failing.

Consequently it is refreshing and encouraging to find industry participating in the Voluntary Air Pollution Control Program set up by the San Francisco Bay Area Council. Actually, industry had led the way by taking individual steps some time ago in installing control equipment, as was reported in the February 1953 issue of WESTERN INDUSTRY.

The program embraces a three-pronged attack on air pollution, as follows: (1) supplying business and individuals with information on the nature of air pollutants; (2) policy and technical advice for correcting air contaminating operations; (3) encouraging and publicizing corrective measures taken by industries and communities.

As far as industry is concerned, it seems inevitable that sooner or later all new plants will have built-in air pollution control equipment, just as sprinkler systems are now a matter of course.

Looking forward

THE AIRCRAFT INDUSTRY in Southern California is taking sensible steps toward developing a long-term reservoir of the right sort of personnel, by telling its story to the vocational guidance counselors in the schools. One of these steps was to hold recently, in cooperation with the Los Angeles Chamber of Commerce, an "Institute of General Aviation in Los Angeles," when counselors were taken through various aviation facilities and taken on a flight over the city. An important phase of the institute was discussion of aircraft job opportunities and the need for more extensive aviation courses in the schools to fit personnel for these jobs.

Other industries have been looking forward, also. The training in paint technology at San Francisco City College, and the project for a rubber technology department at University of Southern California sponsored by the Los Angeles Rubber Group are examples.

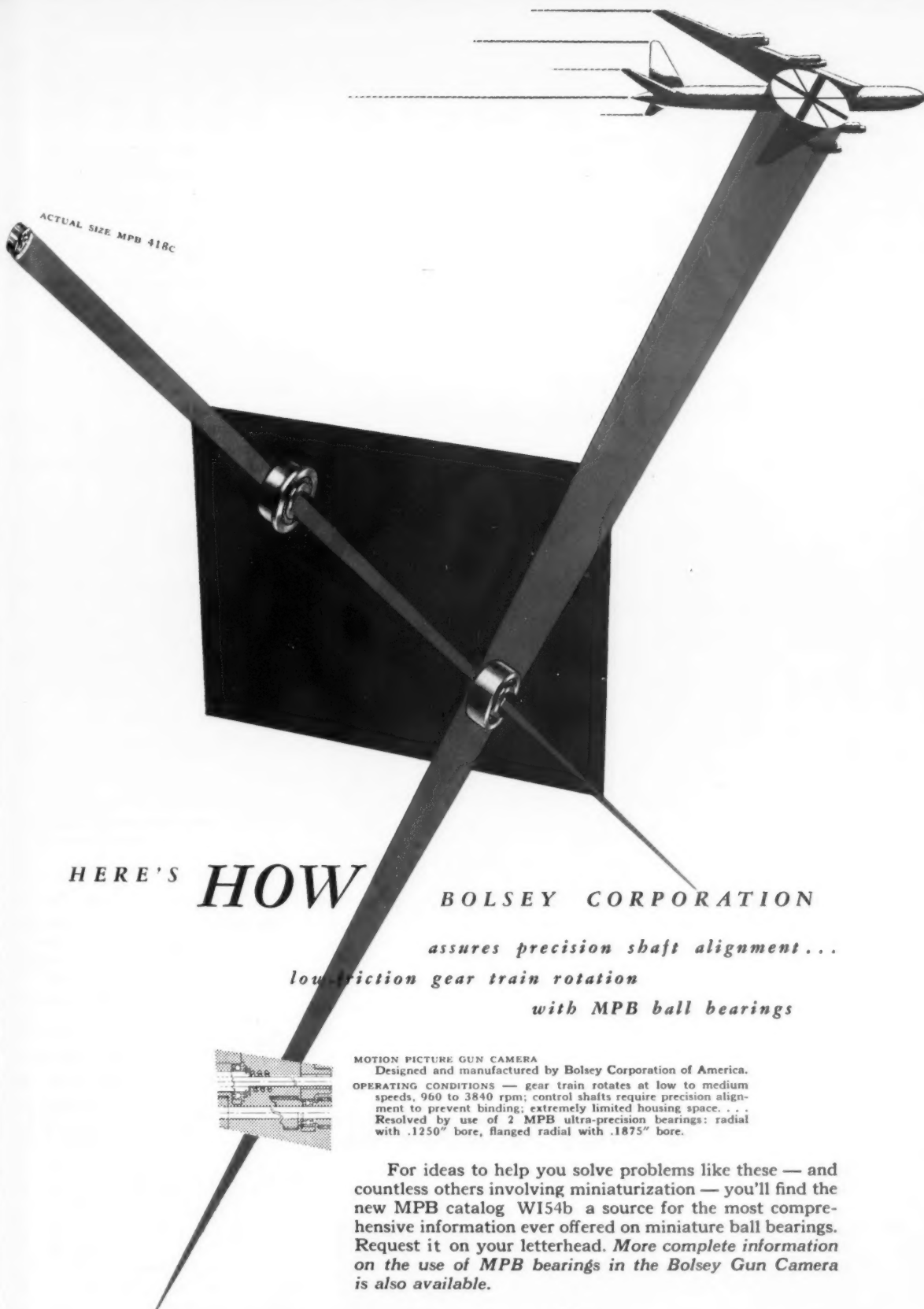
White collars are safe

"LOOKS LIKE today's punch card machine will be the 'covered wagon' of 1964," was the remark we heard after a recent luncheon speech on electronics. When these scientists really get going on these "electronic brains" they astonish and bewilder.

But they also alarm. Believe it or not, fear is expressed that such machines will eliminate the white collar class, apparently the first serious threat of displacement by machine this class has yet encountered. Obviously, the "electronic brain" already mechanizes certain mental operations ordinarily performed by the individual, and will take over even more of them as the machines improve. While not affecting the white collar class particularly, guided missiles prove that under certain conditions the machine is far superior to the unaided human brain.

None of these progressive steps ever hold the individual back, or cost him his place. They merely release him for more intelligent and useful work. The individual tending a machine is not automatized, he becomes a director of an operation.

But the fear, whether of automation in the plant or the complex computer in the office, should be allayed, and promptly. Management should be alert and active to stress that the machine is still man's servant, not his master.



HERE'S **HOW** BOLSEY CORPORATION

assures precision shaft alignment...

low friction gear train rotation

with MPB ball bearings



MOTION PICTURE GUN CAMERA

Designed and manufactured by Bolsey Corporation of America.

OPERATING CONDITIONS — gear train rotates at low to medium speeds, 960 to 3840 rpm; control shafts require precision alignment to prevent binding; extremely limited housing space. . . . Resolved by use of 2 MPB ultra-precision bearings: radial with .1250" bore, flanged radial with .1875" bore.

For ideas to help you solve problems like these — and countless others involving miniaturization — you'll find the new MPB catalog W154b a source for the most comprehensive information ever offered on miniature ball bearings. Request it on your letterhead. *More complete information on the use of MPB bearings in the Bolsey Gun Camera is also available.*

Miniature Precision Bearings, Incorporated

PACIFIC AREA REPRESENTATIVES:

Los Angeles, Edward D. Maltby Co., Inc., 1718 South Flower Street
San Diego, Edward D. Maltby Co., Inc., 745 - 15th Street



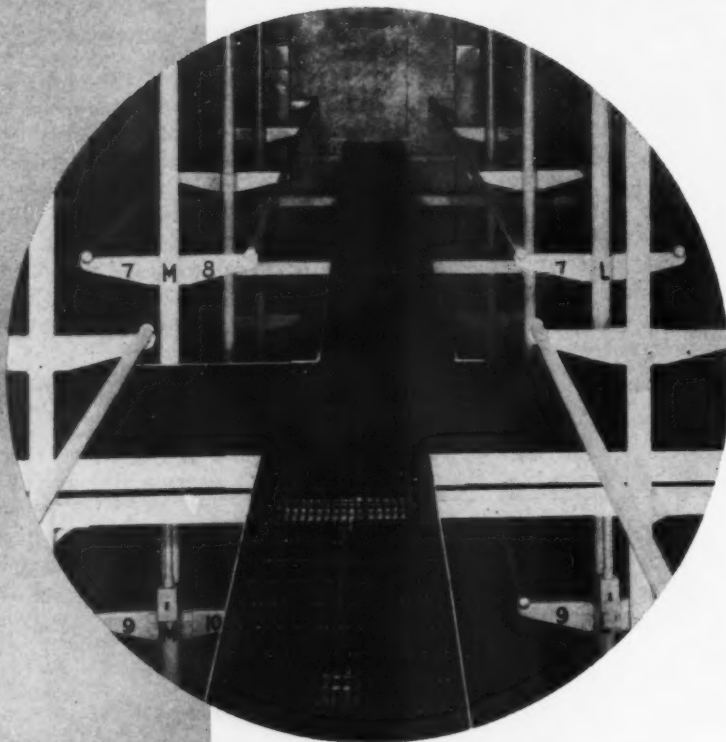
Keene, New Hampshire

Phoenix, Edward D. Maltby Co., Inc., 120 S. 4th Avenue
Honolulu, Edward D. Maltby Co., Inc., 1358 Kapiolani Blvd.

BLAW-KNOX

Electroforged

STEEL GRATING AND TREADS



STOCKED AND FABRICATED ON THE WEST COAST BY:

BSP

BRODHEAD STEEL PRODUCTS CO.

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Harrison & Co.
436 Atlas Building
Salt Lake City, Utah

Edward M. Ornitz & Co.
3938 Wilshire Blvd.
Los Angeles 5, Calif.

J. M. Moore
903 U. S. National Bank Bldg.
Denver, Colorado

LETTERS

Contributions to this column from our readers are welcome. Names will be withheld from publication if so requested. Unsigned letters, however, will be disregarded.

Interested in profit sharing

Editor, WESTERN INDUSTRY:

I have read with great interest the editorial in the November issue of WESTERN INDUSTRY, in which you have discussed the profit-sharing industries.

Our company has experimented with several types of profit-sharing plans, and we are always interested in the success and problems as experienced by others. I notice in the body of your magazine that there is additional discussion on this particular subject.

I would appreciate information from you regarding the organization of the council and whom we might write for additional information on detailed discussions of plans that are used in industry.

We enjoy reading your magazine and always find something that is of interest in our business of metal mining.

CLARK L. WILSON
Vice President, New Park Mining Co.
Salt Lake City

Put to good use

Editor, WESTERN INDUSTRY:

We are interested in obtaining ten copies of reprints of the following articles contained in the November 1953 issue of WESTERN INDUSTRY.

Page 32—"For Increased Sales," by H. E. Eastman.

Page 43—"Plastic Piping—How Good Is It?" by Robert E. Deshon.

D. H. MEISSNER
District Sales Manager
Mechanical Goods Division
United States Rubber Co.
Los Angeles

Response to signals

Editor, WESTERN INDUSTRY:

We are interested in the article in WESTERN INDUSTRY on pages 29, 30 and 31 for November 1953 titled "Let the Foreman Call Signals on Quality Control," and would like two reprints for our library.

EDWARD P. FLEISCHER
Staff Assistant, Consolidated Engineering Corp., Pasadena, Calif.



BEARING FAILURES ENDED

After Installing **Lincoln**
Centralized Lubricant Application
Systems at New Haven Pulp and Board Co.

[Bearings that once failed 2 to 3 times each week now have given trouble-free service for more than a year]

Roll Neck bearings on paper machine dryer rolls at the mill were failing at the rate of 2 to 3 times weekly, due to inadequate lubrication. E. G. Beach, Sales Engineer of the Motor Equipment Co., Bridgeport, Conn., recommended a completely automatic Lincoln Centralized Lubricant Application System. Now, after more than one year of operation, not a single bearing has been lost due to lack of lubrication.

Since the paper machine will operate only two hours without lubrication, the Lincoln system was provided with completely auto-

matic controls. The lubrication cycle delivers .04 oz. of oil to each bearing, every ten minutes.

Previously, the dryer rolls had required ten barrels of oil each week for lubrication, and occasional excessive lubrication caused paper damage. With the Lincoln system, only two barrels of oil per week are required, and paper spoilage has been eliminated entirely.

As a result of this success with dryer rolls, New Haven Pulp and Board is now installing Lincoln systems on other paper-making machines and on printing presses.

• • • PIONEER BUILDERS

LINCOLN
LUBRICATING EQUIPMENT • • •

LINCOLN ENGINEERING COMPANY OF CALIFORNIA

LOS ANGELES, 2844 South Grand Ave. • Berkeley, 3033 San Pablo Ave. • PORTLAND, ORE., 1018 S. E. 8th Ave.



SIMILAR SAVINGS CAN BE YOURS...

with a Lincoln Centralized Lubricant Application System. To find out more about how you can...

- increase bearing life up to 1500%
- eliminate downtime for lubrication
- reduce power consumption
- prevent lubricant spoilage
- reduce labor costs

... write today for your FREE copy of Catalog 80 containing complete data.





As easy as falling off an unstrapped pallet

You need steel strapping on every pallet load, whether it is handled intra-plant or shipped by carrier. You need it for protection to your workers, and the prevention of loss and damage to your shipments.

And—you need **SIGNODE**! Through its fieldmen, Signode can show you how to unitize the right way, no matter what you handle or ship. The services of these men and Signode's respected packaging laboratory are yours for the asking.

Write Signode Steel Strapping Co., 383 Brannan St., San Francisco, California, 659 E. Gage Avenue, Los Angeles 1, California. Offices coast to coast. In Canada: Canadian Steel Strapping Co., Ltd. Foreign subsidiaries and distributors world-wide.

A basic method of preventing accidents to pallet loads in intra-plant handling.



SIGNODE Steel Strapping Co.

SEND FOR FOLDER SHOWING 6 BASIC WAYS OF UNITIZING

CALENDAR OF MEETINGS

FEB. 23-28—*American Concrete Pipe Association*, national convention, San Francisco. Contact Howard Peckworth, managing director, 228 N. LaSalle St., Chicago 1, Ill.

MAR. 2-3—*Institute on Industrial Plant Design*, Biltmore Hotel, Los Angeles. Contact: Franklyn Cole, Los Angeles Chamber of Commerce.

MAR. 3-6—*Western Pine Assn.*, regional meeting, Palace Hotel, San Francisco. Contact S. V. Fullaway, secy.-mgr., Yeon Bldg., Portland 4, Ore.

MAR. 4-5—*Western Candy Conference*, Mark Hopkins Hotel, San Francisco. Contact General Chairman, J. Phelan, Euclid Candy Co., Inc., 715 Battery, S. F.

MAR. 5-6—*Western States Power Show and Conference*, Whitcomb Hotel, San Francisco. Contact H. A. Bachtold, 657 Harrison St., San Francisco 7. EX 2-6724.

MAR. 9-12—*American Management Association*, general management meeting, Fairmont Hotel, San Francisco. Contact Joseph M. Trickett, convention manager, 830 Palo Alto Ave., Palo Alto, Calif.

MAR. 19-21—*International Oil Mill Superintendents Assn.*, convention, Paradise Inn, Phoenix, Ariz.

MAR. 25-27—*Pacific Coast Paint & Varnish Assn.*, regional meeting, San Francisco. Contact R. P. Weber, W. P. Fuller Co., South San Francisco, Calif.

MAR. 25-27—*Intermountain Logging Conference*, regional, Davenport Hotel, Spokane, Wash. Contact C. P. Keim, secy.-mgr., 215 Buffalo Bldg., Kalispell, Mont.

MAR. 26—*Quality Control Conference*, Cubberly Auditorium, Stanford U. Sponsored by Committee on Industrial Engineering, Stanford, in cooperation with Bay Area section, American Society for Quality Control. Contact G. Ireson, Stanford U., Calif.

MAR. 31—*Northwest Public Power Assn.*, regional meeting, Tacoma, Wash. Contact F. Ward, Tacoma, BR. 3141.

APR. 1-3—*Electrical Maintenance Engineers Assn. of Southern Calif.*, annual electrical industry show, Shrine Exposition Hall, Los Angeles. Contact J. J. Singleton, 816 W. Fifth St., L. A. 17.

APR. 11-13—*Pacific Northwest Trade Assn.*, general conference, Multnomah Hotel, Portland, Ore. Contact D. C. Knapp, executive secretary, PNTA, 1217-1218 Joseph Vance Bldg., Seattle 1, Wash.

APR. 19-20—*Illuminating Engineering Society*, regional meeting, San Francisco. Contact J. S. Walsh, general chairman, P. G. & E., 245 Market St., S. F.

Short **WEBB** Conveyor increases production

CASE HISTORY

at Precision Sheet Metal Inc.

"WE HAVE GAINED FLOOR SPACE without enlarging our building," says B. B. HAYDEN, Vice Pres., "because our new Webb Conveyor has eliminated stacking of parts and all material handling floor traffic."

ONLY 415 FEET of Webb overhead conveyor handles almost all of the material handling problems at Precision Sheet Metal. Raw materials move into and through the production area, into the paint department, through drying ovens and finally to the shipping room. Now employees devote more time to production and less to material handling.

The whole conveyor system including the power unit is over head and "out of the way." The speed of the conveyor is adjustable to the number and production speed of the workmen.

It is adjustable also, to the drying time required for various finishes.

Have you ever considered how much time and labor is wasted with manual handling? Or how much space is wasted by stacked parts, hand trucks and carts? A conveyor system can answer many manufacturing problems; get the facts today—write or phone.



SEND FOR THESE BOOKLETS

A wide variety of case history reports showing uses of conveyors in all types of industry are available. They are filled with data and ideas for increasing production. Write for these easy to read bulletins today!



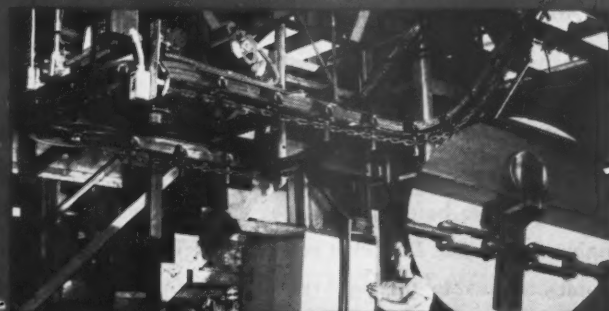
from plant to shipping ...



through painting booth ...



through drying ovens ...



from stockroom to plant



JERVIS B. WEBB

COMPANY OF CALIFORNIA

Conveyor Engineers and Manufacturers

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2000 West Broadway, Suite 100, Los Angeles, Calif.
SAN FRANCISCO 44
2000 Market St., Room 100
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*** Snap-on**

HEAVY DUTY LOXOCKETS



SET 432-HD-B

POWER FOR THE TOUGH JOBS! This is the wrench set to have at hand for the jobs that require size and power and sweeping leverage. These tools give *speed* as well—the big handles, adaptors and sockets are sleekly proportioned, versatile and fast working. The more powerful the wrench, the more you want *safety*—and Snap-on provides it—with positive button locking of units to give the security of a one-piece tool. The Loxocket release pin gives fast interchangeability of units. Available through your nearby Snap-on factory branch. For Snap-on industrial catalog, and 104-page general catalog of 400 hand and bench tools, write

SNAP-ON TOOLS CORPORATION

8032-B 28th Avenue

KENOSHA, WISCONSIN

®Snap-on is the Trademark of Snap-on Tools Corporation.



THIS MONTH'S COVER

AUTO ASSEMBLY grows with the West

WEST COAST assembly of automobiles in 1953 was 658,958 (including trucks, stationwagons, etc.). This is an increase of 180,714 over 1952. Certain large assemblers indicated that the volume and variety of their Western purchases continued to grow during 1953. Some of these new Western produced automobile components include chassis leaf springs and seat pads.

The following figures, provided by National Standard Parts Assn., indicate the distribution and growth of independent automotive repair shops in the West:

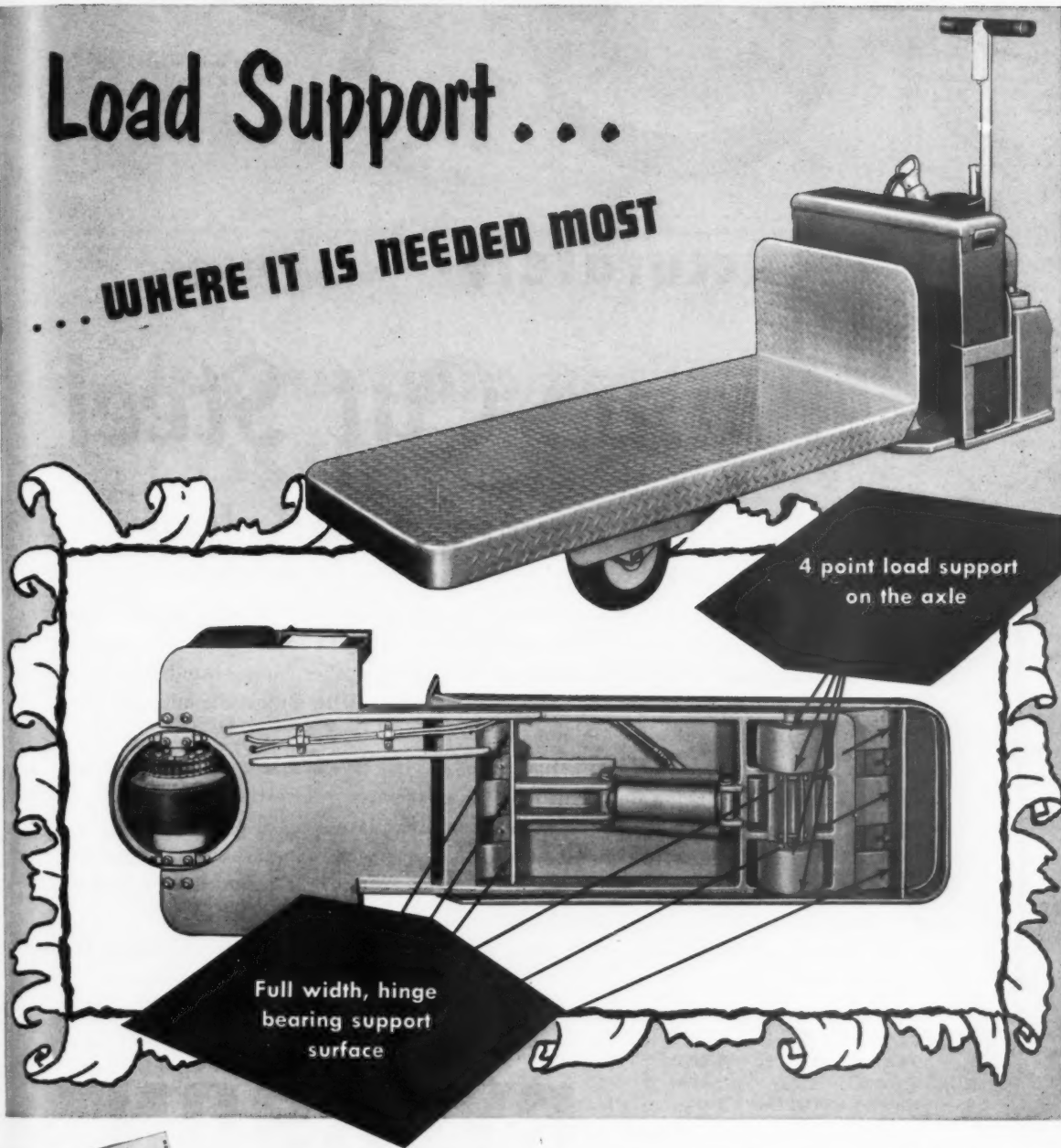
State	Independent repair shops		% Increase
	1949	1953	
Arizona	396	151	162.3
California	6,420	5,163	24.3
Colorado	850	499	70.3
Idaho	511	185	176.2
Montana	357	277	28.9
Nevada	155	99	56.6
New Mexico	402	139	189.2
Oregon	1,367	849	61.0
Utah	511	219	133.3
Washington	1,987	1,222	62.6
Wyoming	173	141	22.7
Total, eleven Western States	13,129	8,944	46.8

A NEW AUTOMOBILE BODY from the adjoining Fisher Body assembly plant is lowered by mechanical hoist to the waiting chassis on the final assembly line at General Motors' Chevrolet plant in Oakland, Calif. General Motors Corp. second annual Motorama, featuring exhibits from all its divisions, is scheduled to run from March 26 to April 4 at San Francisco's Civic Auditorium. Front cover picture also from Chevrolet's Oakland plant.



Load Support...

... WHERE IT IS NEEDED MOST



Platform truck design offers maximum load support and eliminates hinges, pins and bushings. Extra LOAD SUPPORT is only one of the many features found in this model . . . and there is no additional cost for extra LOAD SUPPORT. Trucks are available in capacities up to 10,000 lbs.

Write for Bulletin No. 53 . . . and remember . . . THERE'S A MOTO-TRUC FOR EVERY PURPOSE.



The **MOTO-TRUC Co.**
Representatives in Principal Cities

1963 E. 59th St. • Cleveland 3, Ohio
Pallet . . . Platform . . . Hi-Lift Trucks
LARGEST EXCLUSIVE MANUFACTURER
OF "WALKIES"

Diesel locomotive part
6" thick, 25" in diameter



Spider for blower
3/4" thick x 10" x 11 1/2"



Circular conveyor parts
26 1/2" in diameter, cut
from 1 1/2" plate



Crank shaft blank
1 3/4" x 8" x 16 1/2"

Accurately Flame-Cut Steel delivered quickly

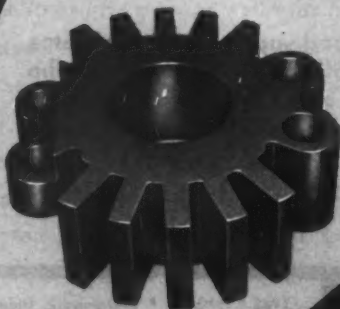
You see on this page a few of the many thousand different flame-cut steel shapes recently shipped from Ryerson plants. In some cases only one or two pieces were produced from a pattern. In other cases—hundreds. But in every case, steel was cut to close tolerance—with almost die-cut uniformity from piece to piece—and delivered quickly.

Have you investigated this money-saving Ryerson service that cuts the cost of producing flat, irregularly-shaped parts? Here the nation's largest steel stocks are at your disposal, including plate steel of every type, up to 10" thick. And here you'll find the steel-service industry's most complete array of flame-cutting equipment, including multiple torch machines that follow the most intricate patterns with an electric eye.

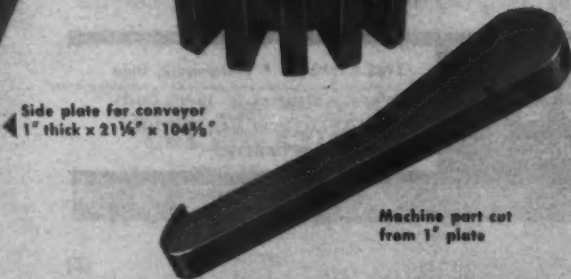
For fast action, send us your sketch or blueprint and we will quote on any quantity.

JOSEPH T. RYERSON & SON, INC. LOS ANGELES—Plant: 4310 E. Bondini Blvd. Mail: Box 3817, Los Angeles 54. Phones: Angeles 2-6141, from San Diego (no toll), Zenith 6440. SAN FRANCISCO—Plant: 65th & Hollis Sts., Emeryville. Mail: Box 188, Emeryville, Calif. Phones: Olympic 3-2933, Enterprise 1-0176. SEATTLE—Plant: 1200 - 4th Ave. Mail: Box 3268, Seattle 14. Phone: Sonoma 2300. SPOKANE—Plant: North 207 Freye St. Mail: Box 2158, Spokane 10. Phone: Keystone 9311.

Locomotive part cut from 7" plate



Side plate for conveyor
1" thick x 21 1/4" x 104 1/2"



Machine part cut
from 1" plate

WRITE FOR FLAME-CUTTING BULLETIN No. 50

RYERSON



Is your automotive fleet COSTING OR PAYING?

*Check your fleet operations against
results of this survey . . .*

MORE TOP management attention to fleet management problems can pay large dividends in reduced investment and lower costs. This is a finding of Booz, Allen & Hamilton, management consultants, resulting from their work in this field and a survey of fleet management practices in the San Francisco Bay Area.

DOES YOUR COMPANY have an automotive fleet? If so, you may be missing significant opportunities for cost reduction.

When the fleet is a subordinate part of the business, it may escape the attention of top management, even though large investments in equipment and servicing facilities are involved. You cannot treat your fleet as a step-child and get good results.

Large savings can result from improved operations. One California manufacturer got an immediate cost reduction of \$30,000 per year through objective analysis of fleet management practices. A Western public utility found that \$130,000 could be pared from its annual operating costs by application of modern fleet management.

A recent survey in the San Francisco Bay Area, covering 24 major fleets operating a total of over 23,000 vehicles, indicates that similar savings are possible in many companies. Maybe they are in yours. See how your company comes out on this quiz:

In the Bay Area survey, one-third of the operators had fleet equipment not suited to their present needs because of:

1. Faulty initial selection of equipment.
2. Obsolescence due to changing operating conditions.

Careful attention to matching equipment with the job can save you money. Design changes on a special service truck body saved one operator 14% on his original equipment investment without impairing operating effectiveness.

Do you have the right equipment?

After analyzing the job your fleet must do, ask yourself these questions about the equipment you have or intend to buy:

1. Is it powered for the job requirements?
2. Is the body adequate for the size of load and type of commodity you wish to haul?
3. Is it built to take advantage of maximum load limitations allowed by law?
4. Will a standard vehicle do as

UTILIZING a standard body, this repair coupe of Pacific Telephone is used for short runs and jobs in town that don't require extensive equipment or tools. Supplies are carried in a specially-designed compartment housed in rear deck. For added room, the spare tire is located behind front seat.

By

**HARRY J.
PRIOR**

Associate
Booz, Allen &
Hamilton
Management
Consultants
San Francisco



well for your purposes as a specially designed one?

5. Will a lower-cost vehicle do the job just as well?

6. Are all special designs fully justified by the job to be done?

7. Is it economical to operate and maintain?

Consider the balance of your fleet size against the work load. Too few vehicles in a fleet can result in poor maintenance and increased breakdowns. Too many run up the depreciation charges. An engineering approach to determining fleet size may substantially reduce your investment and lower your operating costs.



Is your fleet management properly organized?

Where do you place responsibility for operating and maintaining your fleet? Should the responsibility be given to the sales department, the operating department, or should the maintenance organization assume it? Should you have a technically trained specialist to head up your fleet activities? The answers to these and similar questions are important to successful fleet operations.

What will work in one company may not work in another. Your fleet management organization should be tailored to your needs. Check your own fleet organization against these questions:

1. Is responsibility for both fleet operation and fleet maintenance definitely and clearly placed?
2. Are decisions being made as close as possible to where action originates?
3. Are technical decisions made by qualified personnel?
4. Does the organization allow for balanced viewpoints on equipment selection?
5. Are there provisions for prompt settlement of differences of opinion between operating and maintenance personnel?

Are your drivers and mechanics carefully selected and trained?

The men who drive and maintain your fleet have an important influence on costs. A good, safe driver will help you to reduce operating and maintenance costs.

Skilled mechanics will do maintenance and repair work at lower cost.

Do you use modern techniques in selecting your drivers? Our survey of fleet operators showed that less than one-third have well-developed testing programs. Several operators do not even give a driving test before hiring.

A substantial majority of Bay Area fleet operators surveyed have active training and safety programs in effect. When properly set up and administered, these programs are producing results that far exceed their costs.

Where your drivers are also salesmen, are you hiring and retaining men regardless of their safety record? Sales managers should not close their eyes to the fleet cost problem when appraising sales force effectiveness.

How are you doing on selection and training of mechanics? Most companies hire "trained" mechanics, show them where to put their tool boxes, and tell them to go to work. Only one of the companies surveyed had a testing program for selecting mechanics; very few had mechanic training programs. The opportunities to reduce these costs through better selection and training of mechanics have hardly been scratched.

Have you taken the guesswork out of vehicle replacement?

Rule-of-thumb methods of deciding when vehicles should be replaced can be costly. Premature replacements are reflected in excessively high depreciation costs.

Driving vehicles beyond their economical life will result in unduly high operating and maintenance costs. To avoid costly mistakes, a well-managed fleet operation should have carefully formulated guides for making replacement decisions.

Basically, the question revolves around whether to repair a unit or to replace it. As a vehicle gets older, depreciation costs are lowered, variable operating expenses increase and fixed costs remain about the same. Replacement should be made when the average total cost to date rises beyond the lifetime cost estimate for the new vehicle. Obsolescence may justify replacement even before the cost curve climbs.

Are your fleet maintenance costs under control?

The control of maintenance expense is one of the most difficult assignments of fleet management. It is possible to overmaintain vehicles at excessive and unnecessary cost. It is also possible to undermaintain vehicles, resulting in short life and lower operating efficiency. Effective control requires a correct balance between the two choices. Questions to answer are:

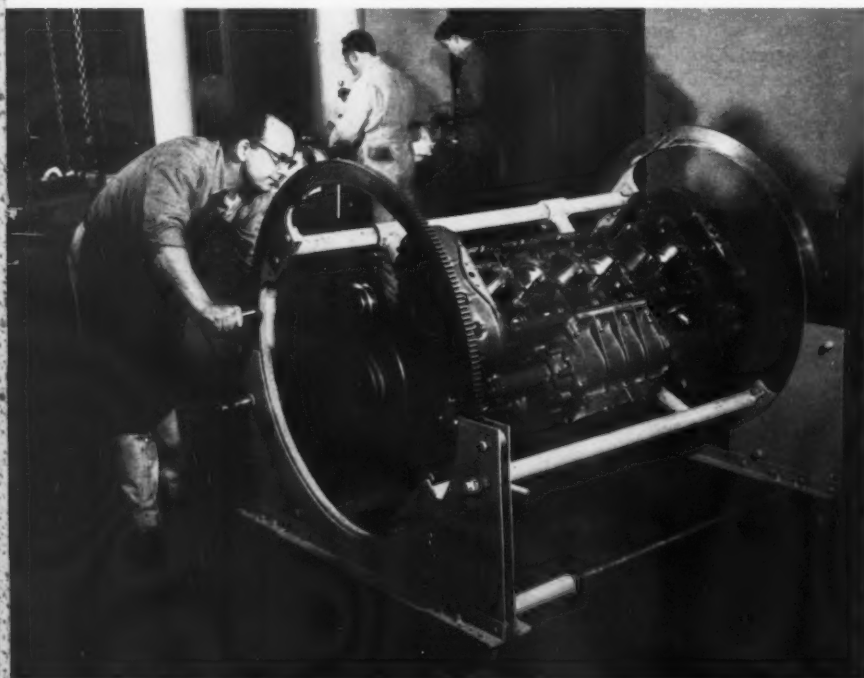
1. Do you have uniform policies covering your preventive maintenance program?
2. Have you looked for opportunities to simplify inspection procedures?
3. Do you have foolproof procedures and inspection forms that insure proper servicing at the prescribed intervals?
4. Are your present washing and polishing costs justified by the value to your business of the improved appearance?

In arriving at the answer to these questions, you should consider how well you can afford a breakdown. Clearly, an automotive fleet operator does not need the same preventive maintenance standards that are used by an airline for its planes.

There is more disagreement among fleet operators about maintenance policies than about any other element of fleet management. Among 24 representative companies, we found these extremes:

	Minimum maintenance interval	Maximum maintenance interval
Chassis lubrication....	Once a week or 750 miles	Once in 3 mos. or 3,000 miles
Oil changes	Once a month or 1,000 miles	Never change oil

ANY SHOP that performs engine overhaul work can adapt this Pacific Greyhound idea. Portable stand permits the block to be rotated so that work is always done from a convenient angle. It acts as a dolly to move the block from one work station to another.



BUSSES at the new maintenance base of Pacific Greyhound in San Francisco are driven over a pit in the garage where interiors and exteriors can be gone over while undercarriage is being checked by mechanics from deck below. No creepers are required in this garage.

Several companies surveyed send oil to an independent laboratory for analysis and change oil only upon the laboratory's recommendations. From its oil analysis the laboratory also makes a detailed engine diagnosis. This spots engine trouble before it reaches the breakdown stage.

Actually, some of the variation in maintenance policy is justified by differences in equipment and operating conditions in these companies. However, many companies simply have not analyzed what is best for their particular operation.

Have you analyzed your storage problem?

The traditional answer to the problem of storing the fleet is to park the vehicles in a garage. If that is still your company's practice, you should take a careful look at the possibilities for cost reduction here. The rising cost of indoor storage has caused more and more Western fleet operators to switch to outdoor storage.

Through analysis of all costs involved, you can determine what kind of storage is best for your fleet. If you operate over a wide geographical area, you may not get the same answer for each location.

Do your fleet records give you adequate control?

Most fleet record systems are not constructed or maintained to provide the information needed for sound fleet management decisions. They do not

point to trouble spots or out-of-line costs.

Good fleet management does not require complex record systems for adequate control. Some of the most effective fleet control systems are relatively simple. But they do provide essential information on a current basis. Check your fleet records against these questions:

1. Are your fleet costs clearly and distinctly separated from other operating costs?
2. Do they segregate controllable costs from non-controllable costs?
3. Are operating expenses accumulated separately from maintenance and repair expenses?
4. Do you have simple, yet up-to-date cost records on individual vehicles?
5. Do you have well-engineered standards against which controllable costs can be compared?

6. Are the record forms constructed for economical posting and analysis?

7. Does top management get timely summary reports that appraise fleet management performance?

Records are not a substitute for sound management. Records can point to trouble, but they do not provide an automatic solution. High gasoline consumption on a vehicle should not automatically mean an overhaul. The cause of the trouble should be found first. It may be the driver who is at fault, not the vehicle.

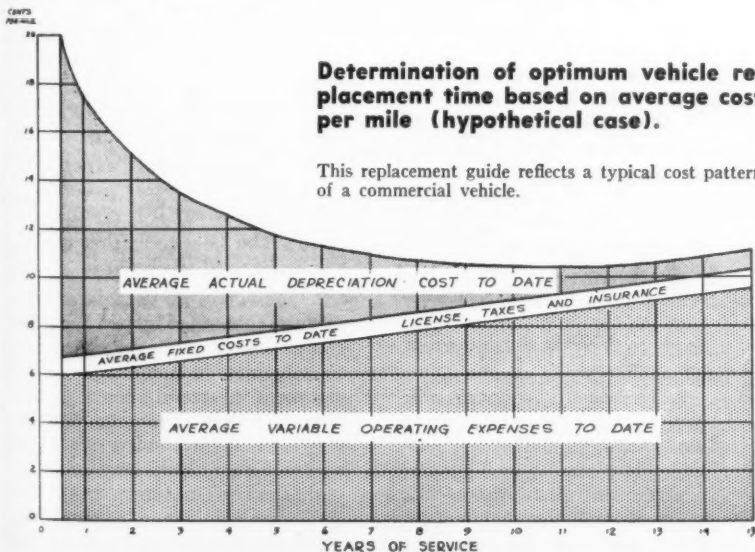
Like many other aspects of fleet operation, there is no one type of record system that fits every company. Your records should meet the particular needs of your business.

Management check list

The objective of fleet management is to achieve the lowest possible cost per unit handled without impairing service. This objective cannot be completely achieved unless all important elements of fleet management are viewed critically and ultimately brought under control. So before you feel satisfied with your fleet operation, be sure that you have:

1. The right equipment for your company's requirements.
2. Properly organized fleet management.
3. Carefully selected and trained drivers and mechanics.
4. Sound replacement policies.
5. Proper maintenance practices and facilities.
6. The right storage facilities.
7. Control through good fleet records.

How does your fleet operation look in the light of these standards? Is it a stepchild or a well-managed part of your company's operation?



PITFALLS IN INCENTIVE PLANNING



Quota-bonus system of selling examined from general and sales management points of view



By
**W. B.
SHANTZ**
Sales and Market
Analyst

QUOTA-BONUS plans for salesmen and sales managers are the rule rather than the exception. The following is a case history of unsatisfactory incentive planning, with a diagnosis of the causes, a discussion of the symptoms, a suggested remedy, and some observations for preventing relapses.

Before going into the details of the unsatisfactory incentive planning of Company A, let me reaffirm my faith in sound incentive compensation for salesmen and sales managers.

For leverage

Money spent for incentive compensation is leverage money. It has far more actual effect per dollar in producing sales than money spent in salary, expenses and car allowances. More sales will be made with a good quota-bonus plan than without one, and the cost of the plan will be a great deal less than the profit on additional sales.

For nine years with Company A, I was an active participant in developing quota-bonus plans and relating them to production levels. This process led to the formal preparation and presentation of a semiannual sales operating budget, which was the focal point for sales planning and for judging company progress.

The period was one of rapid movement in the national economy, rapid national growth, and extremely rapid Western growth in population, indus-

trial growth and urbanization. During this period the property, plant and equipment account quadrupled in value and sales increased fifty per cent.

Company A is a "medium-sized" corporation with current annual sales of less than \$50,000,000 and gross assets in that neighborhood. The fail-

ure of this company to realize the benefits of a sound incentive compensation plan was because there were basic differences in thought at high management levels that were never completely resolved into a satisfactory program.

Company A, in common with many

Eight useful guides in bonus administration

1. Incentive plans gain in effectiveness with simplicity, and lose with complexity.

2. Incentive plans gain in effectiveness by remaining unchanged over long periods of time. Frequent changes destroy confidence in the plan, and therefore its incentive value.

3. Criteria for payment must be made so utterly clear at the beginning of each quota-bonus period that no judgment is needed to determine the amount earned by each participant at the end of the period. Payment must be automatic and based upon concrete figures contained in the usual sales or profit reports routinely available to the individual participants (monthly gross sales reports—monthly salesmen's statements—monthly profit and loss). Any factor that requires judgment at the end of the period tends to weaken the plan.

4. Incentives should be confined to things that are wholly or largely within the control of the participant.

5. The incentive plan must be coordinated with, and in harmony with, the basic sales management planning and general management planning of the

company. It must be an integral part of the budget procedures.

6. Any incentive plan short of a "straight commission" plan should have a stated minimum performance standard before bonus earnings start, so that the fixed costs of salary, traveling expenses, and car allowances may be covered before significant bonuses are payable.

7. Quota setting at both minimum levels and at planned sales levels should be explainable to the participant in terms of:

- (a) The current total market for the product in each territory.
- (b) The company's historic penetration in the market against competitors.
- (c) The reasonable expectation of greater penetration where it is planned.
- (d) The sales tools that will be used to obtain it.

8. Sales credit to the salesmen must be controlled by clear policies and must never deteriorate to arbitrary judgments in assignment of credit. There are always tendencies to give someone "a break" in shadowy cases, and salesmen can be persuasive—that is their business.

or most similar manufacturers, has experienced great dissatisfaction in quota-bonus planning and administration at all administrative levels (general management, sales management and field sales forces). Twice each year, for a period of two months preceding each quota-bonus period, or four months each year, major executives were disturbed by the negotiations, definition of quota-bonus points and changes in methods of quotation and payment of the bonus plans. Each six-month period yielded a new quota-bonus plan which was tried, found wanting and subsequently modified.

The basic conflict was between general management and sales management.

Company A had two principal product divisions which followed completely different cycles of prosperity during the nine-year period. Happenings in one division were known to the sales personnel of the other division. When Division X was selling at full production, and customers were on allotment, salesmen in Division Y were working harder and were being given quotas that discouraged the great majority of them from giving their best efforts. When the positions of the sales divisions were reversed, equally bad results were evident in Division X personnel.

Faults of the system

Over the entire period, in both product divisions, the quota-bonus plan could not be considered to be more than one-quarter as effective in producing extra sales as it should have been.

1. The semi-annual plan was always late by the time management compromises were made. Often, two months of a six-month period had passed before the quotas were in the hands of field sales managers and salesmen.

2. Salesmen seldom completely understood the variations from one period to the next, because their field supervisors could not communicate the changes effectively and with faith and understanding. Almost inevitably the field sales force felt that head office was "against" them.

3. After the end of many six-month quota-bonus periods, the published plan was "softened," and bonus payments were made on a somewhat different, and higher, basis than shown in the original plan. This, too, destroyed faith in the integrity of the plan. It also put a high value on constant "kicking" by the salesmen and their field managers, as it sometimes paid off in lower individual quotas or higher payments.

Many times the reasons for "softening" the plan were known before the

plan was published, and top-level agreement at that time would have produced an effective plan.

The principal cause for the failure must be apparent to many. It was simply a lack of cohesive top-management planning. A satisfactory and profitable quota-bonus plan could have been developed by resolving the conflict between the viewpoints of general management and sales management.

One solution that would have worked would have been to spread the bonus area and lower the rates within it, rather than keep the entire structure high and modify payments.

The top of the bonus area would be full practical production from all non-obsolete production units. The bottom of the bonus area would be the closest approximation of what sales each territory would yield if it was worked conscientiously by an average salesman during the ensuing six-month period, taking into account all measurable economic and trade factors both local and national.

Once the maximum amount was set, it could be relatively stable; but the beginning point, or quota point, could be flexible enough to give all salesmen a chance to earn some incentive compensation by extra effort.

Bench marks of general and sales management

Sales management

1. Bonus plans are worse than useless if a quota is so high that a salesman or manager knows that he is beaten before he starts selling. The rankling sense of injustice rapidly decreases his usefulness.

2. At any level of over-all sales, a good incentive plan will more than pay for its cost in additional sales that would not have been made without the incentive.

3. Capacities for products that are obsolescent are not fair bases for judging sales performance, and additions to capacities in excess of possible sales are also not fair criteria.

4. Even the best sales performance cannot keep sales at peak capacity levels at all times. The market for the products fluctuates.

5. It is more difficult and re-

quires more sales skill to hold an increasing share of a falling market than to sell near capacity when the industry is in balance; and bonus payment cannot substantially disappear at such a time without a serious weakening of effort.

6. A "sound," that is, attainable, quota-bonus system is a powerful influence in attracting and retaining good men in any organization.

Compromise between the conflicting viewpoints has been inevitable and constant as all executives can see the logic on both sides of the question. Past compromises, however, have not been successful in yielding a policy framework that can be regarded as semi-permanent; each new patchwork has been the starting point for further patchworks.

General management

1. Bonus payment is a reward for highly effective and profitable sales effort. Hardship and unsuccessful effort should not count in paying bonuses.

2. The company cannot afford to pay bonuses at unprofitable sales levels.

3. A great deal of sales effort can be expected for the salary, traveling expenses and auto allowances expended in ever increasing amounts at higher rates on more and greater manpower.

4. Past and present investments increasing capacities to keep pace with the growth of the markets, or at the requests of the sales executives, cannot be discarded in bonus bases simply because the market is more competitive and sales are more difficult to make.

5. Bonus payment must depend on something concrete that can be counted or measured, and not upon vague, unexplainable judgments and arbitrary decisions.



BLACK LIGHT is used to detect pseudomonas, or sour eggs. Whites and shells fluoresce under black light if the egg is bad.

Testing with ultra violet or "BLACK LIGHT"

*increases inspection efficiency, is adaptable
to speeding up production*

PLASTICS companies are using ultra violet or "black light" to speed up the curing of acrylics and polyesters;

Radio and TV manufacturers are using it to identify their own tubes, which they mark with invisible fluorescent marking media, in cases of guaranteed replacements;

Lubrication engineers and maintenance men use black light to determine extent of lubrication or leakage;

Leading rubber companies are using it to insure that their gas tanks are leakproof.

Yet, though it is used in one or more companies representing practically every industry in the country, there is still a lot of mystery about black light and its applications.

Invisible rays

Ultra violet, or "black light" as it is commonly called, refers to the energy below the visible violet of the spectrum. Ordinary colors merely absorb certain wave lengths and reflect others from the spectral band which illuminates them. Ultra violet wave lengths, on the other hand, are themselves invisible but they activate certain substances with radiant energy, converting that energy into visible light with a fluorescent glow. Thus, ultra violet actually gives man another pair of

eyes with which he can see beyond the narrow band of radiation which limits his vision.

Translated into industrial use, this other pair of eyes has meant increased efficiency at the point of inspection for many companies.

American Microphone Company, of Pasadena, for example, has discovered that military equipment which must be coated to protect the element against

UNDER black light, areas injured by washing methods show up clearly.



fungus, leaks, or other deteriorating factors can be checked for complete coverage of the coating by placing the article under black light. Additives are frequently placed in the coating to insure brilliant fluorescence under black light, yet these additives do not affect the color under ordinary light.

Firestone and Goodrich have carried a similar use of black light a step further. Reasoning rightly enough that there was no point in giving the inspection department a tool that the production department did not have, they have moved black light onto the production line of their gas tanks.

Since rubber is porous, their problem in making these tanks is to be sure there is no leakage. To stagger the holes, from two to three layers of rubber are used in the manufacture of these tanks, and colored liquid nylon is painted on the first layer as a barrier to dispersion leaks. The nylon fluoresced when it was dry so inspectors could readily detect any small areas that appeared black under ultra violet light.

Used with nylon

Recently, the company decided that the workers applying the liquid nylon should have the advantage of black light. Since the nylon did not fluoresce normally when wet, an additive was



DIRECT PROSPECTING for petroleum now possible by the fluorescent effect produced by ultra violet light. Merest trace of oil, in a concentration as low as a few parts per million, fluoresces under black light, even if it is diluted with mud or water or dispersed in very small amounts throughout the samples, cuttings or cores.

overhead black light fixtures fluoresce the code so it is visible to workers and they can identify the grade.

In the curing of plastics, ultra violet light is being used to shorten the curing time of acrylics and polyesters, replacing sun lamp bulbs. In curing acrylics, which must be void free, ultra violet light but no heat is used. Since heat causes acrylics to bubble, ultra violet lights which produce a minimum of heat have proved practical. Polyesters require both heat—produced by infra-red lights—and ultra violet. A heat and ultra violet catalyst are put into the polyesters, and ultra violet light starts polymerization of the catalyst by stimulating the top part of the plastic and a chain reaction takes place.

Reduced curing time

In the curing booth, four-foot tubular ultra violet lights are distributed evenly so that all sections of the plastic sheets, which are made in 4 x 8-ft. pieces, have 100% coverage. Infra-red tubular lights are placed between the ultra violet lights for heating purposes. Curing time is reduced considerably by this method, and a more continuous and accurate production is possible.

The many and diverse uses of ultra violet light have been both a boon and a king-size headache to Ultra Violet Products, Inc. Their plant at 145 Pasadena Ave., South Pasadena, has gone through several drastic expansion programs in the past few years and currently a 4,000-sq. ft. addition is being completed. The ultra violet production line is set up to fill quantity orders within 48 hours. The research department has been expanded and reorganized to assist manufacturers and distributors in solving special-use problems.

applied to the nylon to make it fluoresce, so workers could detect lack of coverage themselves. Thus, considerable time and handling is saved in rejects by the inspection department.

The second layer of rubber was coated with a non-fluorescent nylon. Again, black light was used at both the production and inspection stage. If any fluorescence was visible, complete coverage had not been obtained.

Fewer inspectors

The system has worked so well in assuring leak-proof gas tanks and in speeding up both production and inspection—only one inspector is now necessary for every three workers as compared to one for each worker previously—that the method is being installed by other rubber companies with a similar problem.

New, more efficient lights developed by Ultra Violet Products, Inc., of South Pasadena, who have pioneered the industrial use of black light, enable these lights to be used under normal factory conditions. Complete darkness is not required. Lights are not harmful to the eyes, and workers appear to have no objection to working under them. No special equipment is needed to install these lights; they plug into any AC socket.

Since oil fluoresces normally, maintenance supervisors and lubrication engineers of many plants use ultra violet lights to check for leaks or incomplete machine lubrication. For this purpose, portable ultra violet lamps which are easily carried about are frequently used.

Fluorescent marking media, invisible under ordinary light but which stand out clearly under fluorescent light, are being used by more and more industries. Marking media include ink, crayon, powder and paint.

TV tubes marked

Manufacturers of radio and TV sets, for example, mark their tubes with invisible fluorescent media so they can identify their own tubes, which are otherwise identical to those used by other manufacturers in the field, in cases of guaranteed replacement.

Similarly, the world's largest manufacturer of inflated rubber products uses an invisible fluorescent coding of grade of product. Thus, when a ball comes down the assembly line, the

ADJUSTABLE black light fixtures which can be used under ordinary factory conditions illuminate fluorescent pattern markings so they are easily followed by machine operator working on embroidery pattern for Vogue shoes.





NAF CLUB officers, in the San Gabriel, Calif., area, get together for a council session at a meeting of the San Gabriel Management Club. Front row, left to right: F. Hough, coordinating council chairman; T. McKibben, NAF director; B. Meek, NAF zone vice president (zone A and F); J. Morley, speaker; and E. Moore, area manager, NAF. Back row, left to right, club presidents: R. MacKay, Fairbanks Morse Club; M. Ruddell, San Fernando Valley Club; J. Wilson, San Gabriel Valley Club; E. Hart, Consolidated Rock; and H. Oldenburg, Virtue Bros.

National Association of Foremen —IT CLICKS IN THE WEST

*Foremen's association has
65% growth in two years*

THE NATIONAL Association of Foremen, an association of management clubs embracing over 60,000 members and representing over 1,300 industries in 31 states, has enjoyed a 65% increase in Western membership during the past two years.

The first two Western clubs were Hughes Management Club at Hughes Aircraft Co., Culver City, Calif., and Convair Management Club at Consolidated Vultee Aircraft Corp., San Diego, both founded in June 1942.

The association had its beginning in 1919 when a group of 18 foremen in Dayton, Ohio, got together to learn how to become better managers. As Charles F. Kettering, the famed General Motors research director and one of the early promoters of the movement, recalls, the foremen realized they were skilled technically but lacked training in the fundamentals of industrial administration and human relations. The foremen expanded their educational club in 1920 to take in nearly 100 men. By 1925 there were so many clubs which wanted to join with the Dayton club that the National Association of Foremen was born.

NAF President Edward O. Seits of North American Aviation, Inc., spends full time on his job as unpaid head of the association, with his company footing the bill. Elected to his second term in September, Seits traveled 50,-

000 miles during his 1952-53 term of office and met with over 20,000 NAF club members.

Primarily educational, the NAF stays out of politics and shuns fights with organized labor. Before a club is accepted for NAF affiliation, its program for a full year must be approved—and its activities must be at least 75% educational.

The NAF is anti-collective-bargaining as far as management is concerned but in no sense condemns collective bargaining by employees so long as it is conducted in a spirit of fair play and with integrity. The NAF has never had a club forsake management and individual initiative for collective bargaining.

Main objectives

Ernie H. Moore, the NAF area manager for the West Coast, with offices in Los Angeles, says the principal objectives are to weld industrial management groups into efficiently operating teams, taking in everybody from the chairman of the board to assistant foreman, and to develop the individual members of the lower segments of management.

He explains that in no sense do top management officials try to run the clubs; foremen and supervisors handle the reins completely. Most company executives speak before their clubs only by special invitation, usually

once each year when they give oral annual reports on their company's progress and the outlook for the future.

"Once this type of information is understood by the whole management group," explains Moore, "every manager—foreman, supervisor or executive—becomes better qualified to speak as a member of management when asked a question by an employee. Also, these better informed management men fully understand how their departments must work with other departments to get the company's job done."

The NAF acquaints its member clubs and their management members with the NAF code of ethics, a management golden rule of seven points designed to elevate the dignity of both employer and employee in industry.

One of the prime responsibilities of the five area managers throughout the U. S. is to train club officers in the meaning and practice of the code of ethics and the techniques of operating a management club. Most clubs have special night-sessions for their members on the application of the NAF code of ethics.

Since 1947 the club at Grayson Controls division of Robertshaw-Fulton Controls Co. at Lynwood, Calif., has handled all collective bargaining sessions for the company. During actual bargaining sessions,

Spells cooperation

ARTHUR SECORD, director of adult education at Brooklyn College in New York, is one of the most popular of the NAF home office sponsored speakers with affiliated clubs on the West Coast. He relates that an Arizona industrial foreman gave him a practical result of NAF work in his department: "Before we had our NAF club, if I needed something from another department, I sent a man over to steal it. Now I simply call the foreman on the telephone and he sends or brings it over."

according to O. V. Pope, industrial relations director and former national director for the NAF, the foremen's group does not accept or reject any union proposal until the whole management team is called together to discuss and to vote on it.

Tom Arden, executive vice president of Grayson Controls, says his NAF foremen are doing "a better job than any of our so-called hot-shot experts have done with previous contracts."

In 1946 a West Coast aircraft company was threatened with the immediate organization of a foremen's union. The foremen said they did not feel a part of management. The company's executives did not like the tactics of the union organizers and decided to fight fire with fire, so telegrams were prepared for each supervisor ordering him not to vote for the foremen's union at the NLRB-authorized election.

Roy J. Bell, now training director at Hughes Aircraft Co. and then the president of a California NAF club, went to a vice president of the company and agreed to take full responsibility if the company would allow him to apply some NAF principles to dealing with the foremen and supervisors. According to the NAF code of ethics, he argued, a man will do much more if asked to do it than if ordered to.

Program set up

Bell set up the program, invited everybody in the company's management group, and in an atmosphere of dignity and respect the company president made a talk on his plans for the growth of the company and what the future held for management. Several days later, the NLRB election was held and over 90% of the supervisors and foremen voted in favor of no union. Ninety-eight per cent of the

eligible voters turned out for the election.

During the final months of World War II, an NAF club in a Seattle aircraft industry heard a company official tell them the Federal government had to have a new high-speed jet fighter plane in 183 days, in order to avoid the European war's being prolonged at a great cost of lives and resources. Ordinarily, he explained, the job would require two years.

"There are two ways we can go about getting such fast production," said the executive. "One is by using a bullwhip . . . like this." He held up a whip. "The other is by the NAF code of ethics . . . like this." He held up a copy of the NAF code. "Now, which shall it be?"

The men voted unanimously in favor of the NAF code of ethics. The job was begun and completed in 181 days—two days ahead of schedule.



Edward O. Seits
President
National
Association of
Foremen,
North American
Aviation, Inc.,
Los Angeles

Companies with NAF clubs report to the Dayton home office that through the years written grievances received from labor by top management have decreased in proportion to the increase of oral grievances received by their foremen. One NAF club has not had a grievance go beyond its foremen in over nine years.

Robert E. Gross, president of Lockheed Aircraft Corp., Burbank, Calif., makes no bones about having great confidence in the work of the NAF. During a three weeks' strike in 1952, Gross pointed out, there were fewer management absences from work than during periods of normal production in the history of the company.

At the Ryan Aeronautical Co. in San Diego, over 94% of the eligible management team members belong to the Ryan NAF Management club. The club has provided stimulus for a conservation program, which is a suggestion plan for management. In September the program had been in effect for ten months, and 659 management suggestions had accounted for company savings of \$578,755.98. More than half the ideas submitted resulted in tangible dollar savings to the firm.

Convair NAF Management club sponsors a "cost improvement pro-

posal" program much the same as Ryan's conservation program. During the first five months of 1953, Convair Management club members submitted 1,219 suggestions for more efficient operations procedures. Of these, 467 were instituted at once, for a saving of \$969,126 and 515,060 man-hours.

Western scholarships

Most West Coast NAF clubs annually give university scholarship awards to outstanding sons or daughters of company employees. The Convair Management club at San Diego, for instance, gives three annual awards of \$500 each, and then all the West Coast (Zone A) NAF clubs get together for a \$500 zone award to be given to the most outstanding club scholarship award winner. Twenty-one club scholarship award winners competed for the zone award last spring.

One president of a small NAF club in Los Angeles said he wasn't able to document, in man-hours or dollars, the advantages derived from NAF activities through good management-employee relationships, "but we feel that the benefits have contributed materially to making our company a good place for everybody to work."

Many clubs have worked out programs of adult education for their members in cooperation with nearby colleges or universities. The Southern California Council of NAF Clubs is sponsoring its fifth series of "executive supervisory development" courses in conjunction with the University of Southern California. The courses are open to all members of NAF clubs in the area, and classes are offered in practical psychology, methods study, manufacturing control, aircraft scheduling and estimating, personal finance, law for laymen and office procedures and management.

Industrial leaders from factories in Southern California join with USC professors to teach the NAF members. Upon completion of four courses an NAF-USC certificate is presented to the foreman-scholar.

Spells success

A FOREMAN from Oregon wrote the national headquarters recently: "If I have been successful, and I think probably I have, I owe it all to the NAF. I was alone in my job until I joined the NAF and found a group in which I took on self-respect as a member of the management profession."

820 TRAVEL FEET SAVED



Westinghouse repair and manufacturing plant re-arranges and modernizes its facilities

BY REARRANGING and modernizing Westinghouse Electric Corp.'s manufacturing and repair plant at Emeryville, Calif., work travel has been reduced to a minimum and 820 travel feet have been chopped off the distribution transformer repair operation.

Repair work of all kinds is now handled, as nearly as possible, on a production-line basis, passing on savings in delivery dates to customers.

Burned-out distribution transformers are received in a yard at the rear of the building, where they are stored until new cores have been assembled. These transformers are then brought into the shop where old cores and bushings are removed, and tanks and lids are boiled in caustic solution to remove paint. Tanks are then fitted with an adapter suitable for new design core and are painted with a mica-containing paint providing protection from the elements.

After painting, new cores are installed on roller conveyor lines, bushings are installed and the transformers are filled with oil, vacuum treated and tested.

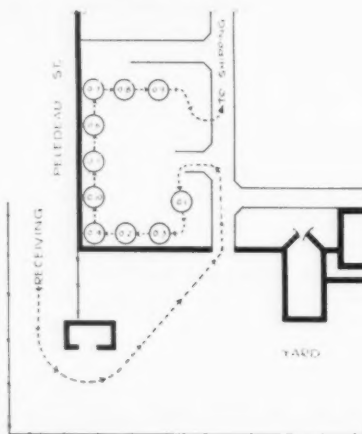
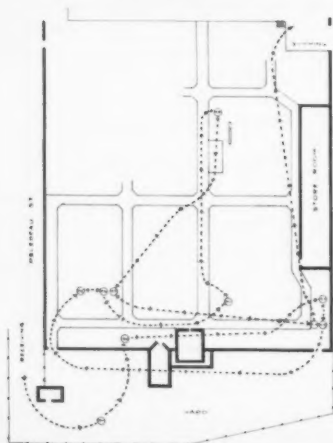
Included among the plant's improvements are: a pressurized meter repair room with air changes every 20 minutes; a modern, totally enclosed test switchboard furnishing increased capacity and safety and increased manufacturing facilities for stator and rotor coils.



Flow diagram of distribution transformer repair

Old method

New method



TOP: Distribution and power transformers up to 500 kva. are repaired in this transformer repair section at the Westinghouse Emeryville, Calif., repair plant.

MIDDLE: Distribution transformer repair work wherein cores and bushings are assembled into tanks already cleaned and painted and are then transported by roller conveyor into a vacuum tank.

BOTTOM: Old and new production lines for transformer repair illustrate how the operation has been rearranged from 1,300 feet down to only 480 feet of travel. The various operations are as follows: (1) dismantle, (2) weld in lugs, (3) caustic boil and steam clean, (4) prime paint, (5) assemble new core and coil, (6) fill with oil, (7) vacuum, (8) test, (9) empty oil, (10) finish paint.

**Learn to understand
as well as reprimand**

**First of four articles tells
you about . . .**



HUMAN-RELATIONS PRACTICES YOUR SUPERVISOR CAN USE

By W. DON WEIDNER, Management Services, Colorado Springs, Colo.

ASK A SUPERVISOR if he feels the human relations part of his job is important, and he will be surprised you asked such an obvious question.

Next ask him how he goes about carrying out his fervor for human relations and he will be wildly grasping for an answer or truthfully admitting never having really given it much thought.

This reaction is typical of the widespread lip service given to human relations. We do not practice what we preach—and this gets us into trouble with people—not because we do not want to practice good human relations, but because we do not know how.

Most supervisors do not actually know how to get along with others. We believe it, but matters usually end vaguely here. As evidence, most supervisory training programs involve subjects like scheduling, quality control, methods engineering, costs, organization and policies, with usually one meeting devoted to human relations. Now these former subjects are necessary, but their importance-ratio to human relations is far out of line. As a matter of fact, all these subjects would be more easily made effective if human relations came first rather than last.

Human relations is understanding people by first understanding yourself. It is as simple as that.

All of us are motivated in two oppo-

site directions. First, we desire to be like others, to "belong," to cooperate. We join a bowling team, not just because we like bowling, but because we also want to be part of a group, to be "counted in." Our youngsters insist on dressing like the rest of their classmates, because to dress differently would mean being considered "queer," and emotionally they cannot afford that.

Then we desire to be unlike others, to be an individual. Bill gripes when asked to follow established and approved manufacturing specifications. Bill says it should be done another way: his way. Bill is not always this way, but today he is; he is feeling independent.

Decisions, decisions

The fact that we cannot be both dependent on others and independent of them at the same time makes for emotional conflict. At each decision, we must decide whether to go along with the matter, to give in and be upset; or to demand that our way be followed and wonder later if we were right. If we go one way too often, we feel frustrated; we get that "walked-on" feeling. If we express ourselves just as we want to, too often, then we begin to feel guilty about our cockiness. In each case we seek the opposite motivating force to quell the emotional stress that wells up within us.

This compensation of seeking the

opposite motivating force sets up an emotional disturbance within us—the mixed-up feeling, the emptiness in the pit of the stomach, the "mad" feeling.

A weighty decision disturbs us because we realize no matter what course we take we will be sorry we did not take the other. Many people refuse or cannot bring themselves to a decision because they cannot face this resulting conflict.

Conflict is expressed in many ways, from the firecracker type, the fellow who blows his top, to the ulcer type, the person who keeps everything within himself to such an extent that his normal health pattern is upset. Most of us fall in between these extremes.

Since no one lies dead-center between dependency and independency, we find one of the other traits predominates. But even this does not prevent us from a normal swing to our opposite extreme. If we are normally dependent, then to independence; if normally independent, then to dependency.

Humans are so constituted that they cannot easily withstand this conflict. We sidestep it; refuse to face it; run away from it. How? By lying, by blaming others, by finding reasons why we did what we did (rationalizing). We pass on our conflict to others; take it out on others.

A supervisor unfortunately is in a good position to take it out on someone—and he does so most times with-

out realizing it. Taking it out on someone is the same as passing on our conflict, refusing to face and deal with and accept it as a normal situation, and emotionally adjust to it.

If the supervisor realizes this is taking place within himself, he can recognize the same thing taking place in others, and if he does he is in the best position to know what to do. He looks for symptoms and deals with them.

If the supervisor will understand his employees he will understand the preceding in relation to himself. More than this, he will see these matters developing and take steps at the proper time to help the worker. This is human relations, understanding people.

A case example

Joe is absent; he does not call in. Next day you, as Joe's supervisor, ask for an explanation. He says his car broke down and that he could not get to work. Later that day a fellow supervisor inadvertently comments that he saw Joe downtown shopping with his wife.

There are the facts. What are the human relations involved? Do we have good grounds for disciplinary action?

A supervisor grounded in human relations would probably reason thus: First, Joe was acting independent. He did not care, for the moment, what happened; he was going to take off. Telling Joe he had no right to that attitude would start a defensive action on Joe's part. When finally confronted, as he knew he would be, Joe lied about the real reason; he felt guilty about his cockiness, his staying away from work without good cause. This guilt made him feel uncomfortable. To get rid of this guilt he lied, giving an apparently good reason for his act.

WHY-MINDED APPROACH

Railroad finds it pays off

A PROGRAM to instill in the minds of all company personnel a desire to learn "Why?" has been effective with the Denver & Rio Grande Western Railroad.

If a practice has been in effect two years, they look it over carefully. After five years they look it over suspiciously. After ten years, they are tempted to throw it out and begin all over again.

"Procedures research" describes the activities of committees who go through the railroad departments asking why they proceed as they do in carrying out their work. Groups of young men from various departments

Now, what does the understanding supervisor do after he has found Joe has lied? He knows there is a real reason for everything. His job is to find the real reason. A supervisor with these few facts and an understanding of human motivation can construct what happened in Joe's thinking and plan an appropriate course of action.

Good human relations is understanding what is going on, what is happening to the other person and then prescribing a remedy. The remedy might be a talk, letting the person alone, offering help, etc.

Reprimanding, at least in many forms, ridiculing, ignoring are not ways of helping. This is merely superimposing another problem on the employee, who, in his own estimation, has more problems than he can handle now. So he fights the imposition of this problem, and it appears to the non-understanding or untrained supervisor that Joe is resisting.

So, good human relations means understanding that conflicts or emotional disturbances arise because we cannot be like others at the same time we want to be ourselves. We know we cannot join them and at the same time ignore them, nor can we cooperate and yet be independent. These emotional disturbances cause us to lie, to blame others, to give us good reasons why, to pass on these conflicts to whomever is convenient when we must face up to an issue.

Helping others meet their conflicts squarely, helping them to understand that it is necessary that they do so, while not adding to their conflicts by forcing them to lie or blame others—but getting at basic reasons for employee actions—this is good human relations.

make up these teams. For example, about reports they ask, "Why is it made?" "Where does it go?" "How is it used?" and similar questions.

One current result of this research is that the accounting department is now up-to-date with reports that used to be 60 days late. Cost controls save money because reports are up to the minute.

Another good result of these studies is that members of the research committee often find themselves. Round pegs are attracted to round holes. Perhaps mechanical department clerks will become traveling auditors. Or possibly young accountants realize that they belong in the operating department. Getting people to think analytically often saves more money than improvements to machines, the railroad has found.

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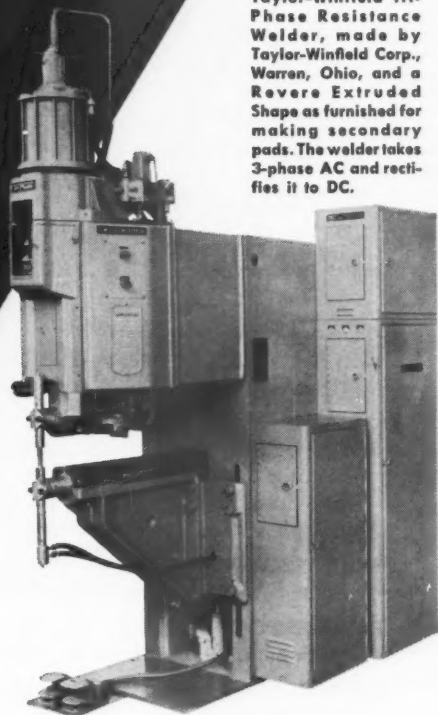
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• The channel shape illustrated here is a Revere Extruded Shape in copper, as supplied to the Taylor-Winfield Corp., Warren, Ohio. After a small amount of machining, it becomes a secondary pad in the Taylor-Winfield Tri-Phase Resistance Welder. Originally the pad was machined out of solid bar, 2" x 3½". The bar cost \$11.73 per foot. The extruded shape substituted for the bar, being nearer the finished form, weighs less and costs \$10.03 per foot, an immediate saving of \$1.70. You can see right there that though the shape costs a bit more per pound, it still saves money. But that is not all. Taylor-Winfield says that the shape has cut machining time by 50%. As every manufacturer knows, machining is expensive, and cutting it in half saves a lot of cash. In addition, there is less scrap, and production rolls along faster. We have in our files a Call Report stating: "Customer has found the extruded section very satisfactory, and bases his machining time-saving on production runs and not estimates."

Credit for this fine achievement has to be shared by a number of people, both in Taylor-Winfield and in Revere. Our Sales and Technical Advisory staffs collaborated closely with the customer's engineering, production and purchasing personnel. Everybody considered all angles, and worked out this money-saving plan.

So we suggest that if you are doing any extensive machining of copper and copper alloys, or aluminum alloys, it would be a good idea to look into Revere Extruded Shapes. They might offer you important economies. We will be glad to consult with you. Just get in touch with the nearest Revere Sales Office.

... SPEED REDUCER COMMENTS ...

THE FOLLOWING comments were received from Westinghouse Electric Corp. and The Cleveland Worm & Gear Co. on the series of three articles on power transmission equipment appearing in the September, October and November 1953 issues of WESTERN INDUSTRY:

The Cleveland Worm & Gear Co.

Being the oldest and largest manufacturer of worm gear speed reducers in this country, the article in your September 1953 issue entitled "Your

Power Transmission Equipment" was read with a lot of interest. Most of your article met with our hearty approval, but it did bring up a few points that might be misconstrued by a reader having very little experience with worm gear speed reducers and on which, with your indulgence, we would like to make a few comments.

The photograph that heads up the article shows a Cleveland Worm Gear Speed Reducer that was shipped on April 28, 1926—over 27 years ago. Naturally, it has given excellent serv-

ice to its user, but its design is now obsolete and for an article of this kind, we could have furnished a number of photographs showing speed reducers of a more modern design.

On page 37, vertical type speed reducers are discussed with the gear shaft extending downward and mention is made of several means of sealing this shaft against oil leakage. You might be interested in knowing that our company manufactures one reducer of this type that is absolutely drip-proof. Usually, the very small amount of seepage that occurs in our standard vertical reducer with its lapped face-type carbon ring oil seal is not objectionable, but when it is, a catch basin is mounted just below the seal so that any leakage however minute can be caught and periodically drained at a point outside of the machine itself. Also, we do not advocate the use of pressure grease gun fittings on speed reducers. When these are used invariably someone forgets that the fitting must be lubricated occasionally and consequently bearing trouble results. Our vertical reducers are equipped with a simple piston-type pump that pumps oil to the upper bearing through rifle drilling in the gear shaft.

On page 38, you discuss fan-cooled reducers and say, "Certain units are lubricated by a method which does not require submerging the worm in oil."

We know of no fan-cooled reducer being manufactured where it is not necessary to submerge the worm in oil. Our company pioneered the development of fan-cooled worm gear speed reducers and we maintain almost the same oil level height on this type as on the conventional-type reducers. The advantage of the fan-cooled type is that the forced air stream provides so much faster cooling of the oil in the reservoir that the thermal limitations necessary with conventional reducers can be disregarded and the fan-cooled reducer can be rated at its full mechanical capacity. This usually means that with worm speeds of from 1,150 to 1,750 rpm., and with fairly large ratios of reduction, almost twice the horsepower capacity can be transmitted by a fan-cooled unit when compared to a conventional reducer size for size.

Also on page 38 the statement is made, "The worm always has its axis horizontal, but the shaft on which it is mounted is horizontal in many units." This is somewhat confusing. In any quality worm gear reducer the worm is made integral with the shaft and it is true that in most cases the worm is mounted horizontally. How-



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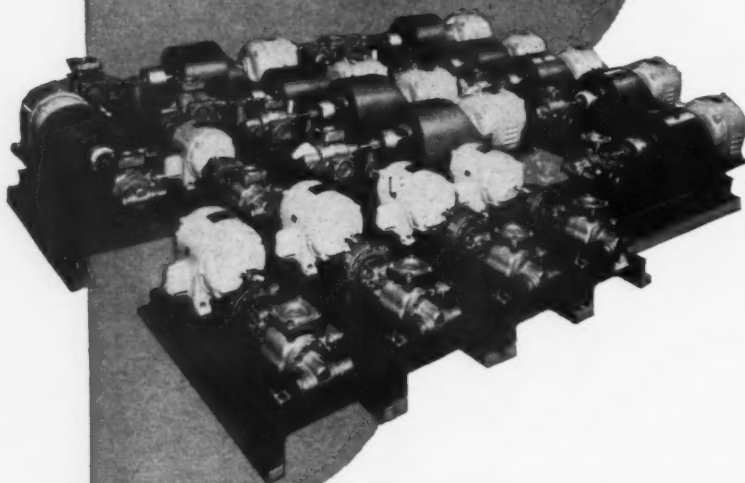


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SPEED REDUCER COMMENTS

... Begins on page 44

ever, in many cases, special speed reducers are built where the worm is mounted vertically. In such cases it is usually necessary to lubricate the upper worm shaft bearings by an oil pump built integral with the reducer.

The available ratios of reduction afforded by worm gear reducers, as listed in your article, are not quite correct. Our company builds single reduction worm gear reducers with ratios from 3-5/9:1 to 100:1, depending somewhat on size and application. And we build double reduction worm gear reducers with ratios from 15:1 to 9,900:1. Triple reduction worm gear reducers have also been built with ratios up to 50,000:1.

Under the subject "Worm gear advantages" the statement is made, "Worm gear efficiency drops steadily and appreciably as speed ratio increases. A large power loss is involved in high-ratio worm gear installations requiring large capacity and continual operation. Other things being equal, worm gear reducers should not be applied on such installations." In our opinion, that statement is especially misleading.

It is true that the efficiency of worm gearing decreases with the ratio of reduction. The worm gear efficiency tables published by the various manufacturers of that type gearing are factual and are based on actual test conditions and field observations. Even so, with a reduction ratio of 50:1, the efficiency in a well-built speed reducer is over 75%.

To obtain this same ratio of reduction with other types of gearing either a double or a triple reduction reducer would be required having two to three times the number of moving parts necessary in a single reduction worm gear reducer—each with its efficiency loss. While the claimed efficiency of a 2 or 3 stage helical or herringbone gear reducer may be higher than that of a worm gear reducer, still the actual efficiency is usually not much greater. It should be remembered that efficiency depends upon a lot of factors other than the type of gearing itself. An oil seal that is a little too tight can mean an efficiency drop of 5% or more.

Actually, there are many advantages to the use of a worm gear reducer in the larger horsepower ranges and with large ratios of reduction. A considerable portion of our sales consists of worm gear reducers in that category. One of the greatest advantages of a worm gear reducer is that a large ratio of reduction can be ob-

"Live steam and boiling water do not destroy UNOBA's adhesive film of protection."

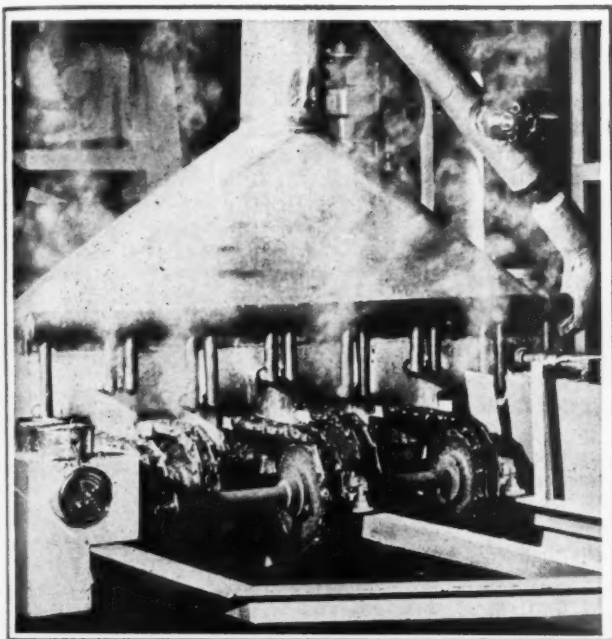
Glenn H. Copeland,
general manager of
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San Diego Cannery.



"We have found in particular that live steam, and the boiling water used in our clean-up operation after completing a pack do not destroy UNOBA's adhesive film of protection."

"For the past six years we have used UNOBA grease throughout our San Diego cannery. During this time multi-purpose UNOBA has proved to simplify our lubrication problems in addition to providing economy of operation."

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The Port of Long Beach possesses shipping facilities second to none in the world. The comprehensive plan of development now under way has already produced the world's largest and longest pier; the world's largest clear-span transit shed used exclusively for cargoes; and its all-weather eye, the first commercially operated radar station in the United States.

Other features of the Port of Long Beach are its expansive outdoor paved storage areas; the bulk loader capable of handling over 500 tons per hour; water depths to take any ship afloat; and an income from its shipping business plus a revenue from the Port-owned oil wells that will allow Long Beach to continue virtually unlimited expansion of its debt-free harbor.

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SPEED REDUCER COMMENTS

... Begins on page 46

tained in a single stage with consequently fewer moving parts, less weight and smaller floor space requirements.

L. O. WITZENBURG
General Sales Manager

* * *

Westinghouse Electric Corp.

In the October issue of your magazine you offered a most interesting and provocative article on speed reducers with particular emphasis given to helical and herringbone gearing. You are to be congratulated for covering so many of the high points embraced by this subject.

However, I believe you failed to emphasize clearly that helical gearing is accepted and used much more widely than is the herringbone type and it deserves more than passing comment. For every installed herringbone reduction unit there are several times more helical gears working on every type of application. This proportion shows many signs of increasing because manufacturers are announcing new or redesigned reduction units using the extremely adaptable features of helical gears and pinions.

A detailed discussion of the pros and cons involved in using either type is not in order here. However, a major characteristic favoring helical gearing is the fact that the teeth can be cut by the hobbing process which is generally conceded to be the most accurate method available today on a general commercial scale. On the other hand, continuous tooth herringbone teeth must be shaped on Sykes (or similar) equipment which must be unusually well set up and maintained to obtain finished gears with tooth spacings and other critical errors held to the tolerances commonly obtained with hobbled helical gears. Double-helical gearing (frequently called "herringbone with a groove") is actually a specialized refinement of helical gearing and should be considered more of a member of the helical family than of the herringbone type.

It should be plainly emphasized that helical reduction units do not suffer in the least from a comparison with equivalent herringbone equipments as far as load capacity, noise level, ease of maintenance and other important factors are concerned. As your article stated, speed increasing units are an entirely different type of machine and double-helical gearing is usually used in them because of the different design and operating factors although helical



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Stocks of tube, rod, bar, strip, sheet and wire in a variety of alloys.

SPEED REDUCER COMMENTS

... Begins on page 46

gearing has been used frequently for this service.

I realize that a short article such as "All About Speed Reducers" cannot discuss each type of drive in detail and the lack of emphasis on certain points is an error of unintentional omission. However, I do want to bring this to your attention and to offer my assistance or comments on any similar articles which you may undertake in the future.

A. S. DAVIS

Gearing Division Representative
Pacific Coast Region

HANFORD'S HEAT to be used

ENGINEERS at the government's Hanford atomic energy works at Richland, Wash., have developed the first practical industrial utilization of waste heat from atomic reactors by using water carrying away reactor heat to warm the air circulated through some plant buildings which are now in the process of being constructed.

The amount of heat being used is enough to heat a thousand average homes. The system, which was designed by engineers of the General Electric Co., prime contractors for the Atomic Energy Commission at Han-

ford, will be used to heat several buildings, but most of it will go into a main structure housing a production reactor.

A large quantity of water from the Columbia River is used to cool the reactors for the plutonium production facilities at Hanford. After it passes through the reactors, it is pumped back into the river, carrying a considerable amount of waste heat with it. The new heat recovery system will transfer some of this heat to air going through plant air conditioners.

Initial investment for the project has been estimated at about \$614,000. The annual operating cost, excluding repairs, will be about \$2,200. A fuel saving of \$59,000 a year is expected to pay off in seven and a half years the difference between the cost of the heat recovery system and cheaper conventional steam heating.

British have one

A heat recovery system is now being used at the British atomic energy plant at Harwell, England. However, it is reported to be much smaller than the one included in the construction program at Hanford.

Since dissolved minerals in the water become slightly radioactive when passing through the reactors, a heat exchanger will be used to warm up water in a secondary piped circuit that relays the heat to an air conditioning system. This protects plant areas from possible concentration of radioactivity in the water.

A constant flow of air is maintained across the reactors to the outside to prevent movement of contaminated dust particles from the reactor to working areas. Consequently, no air is reheated or recirculated within the building. Instead, a large volume of air per minute is pumped in from the outside.

The heating system consists of three major elements. First, there is a primary exchanger which transfers heat from the effluent stream to an intermediate fluid. A secondary exchanger transfers heat from the fluid to the air and a third device, a by-pass exchanger, provides adequate heating when the reactor is shut down. The by-pass exchanger is supplied with steam from a standby steam-electric plant at Hanford.

The reactor heat, a by-product of the nuclear reactions involved in converting uranium to fissionable plutonium, has been of great interest to engineers at Hanford, who have looked forward to its industrial application ever since the plant began operation in 1944.



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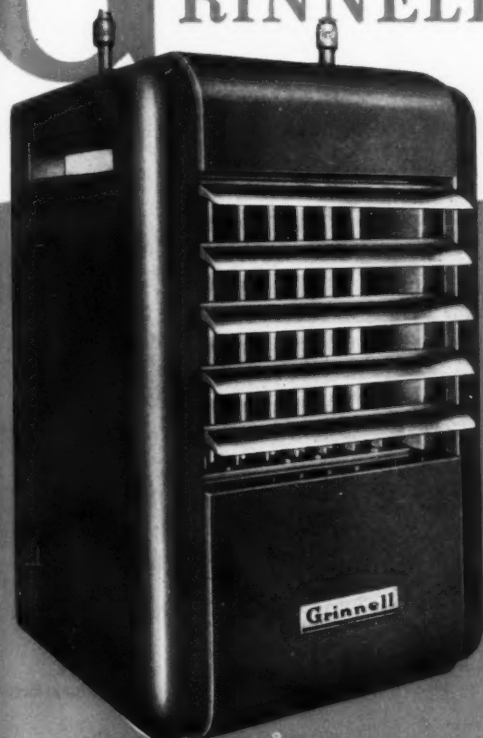
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AND CLOSE EASILY,
QUICKLY, TO SAVE
LABOR COSTS.
- 3**
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STURDILY—SAVE BOTH
HANDLING TIME AND
SPACE.
- 4**
IT MUST ABSORB
SHOCK—NOT TRANS-
MIT SHOCK TO MY
PRODUCT.
- 5**
ITS LIGHT WEIGHT
MUST REDUCE TARE
WEIGHT—KEEP FREIGHT
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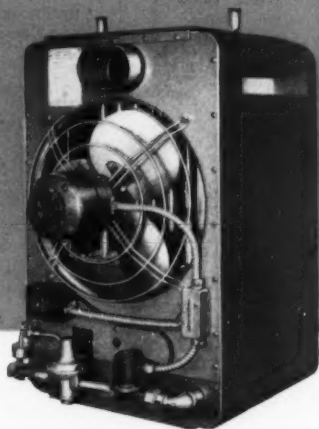
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HERE'S AN EXAMPLE

Hot foods, hot coffee on the way to Cannery workers in the field to save time lost bringing workers in for meals.

SECOND INSTITUTE on plant design

THE SECOND Institute on Industrial Plant Design will be held at the Biltmore Hotel in Los Angeles on March 2 and 3, 1954.

Purpose of the institute is to provide factual, up-to-the-minute information in sequential form to industrial management on effective procedures in new plant design and plant expansion.

The program is as follows:

Tuesday, March 2

General Chairman: EARLE V. GROVER
President, Apex Steel Corp.

MORNING SESSION

How to Program Your Requirements

by KENNETH C. GRANT
Structural Engineer,
Grant & Bruner, Ltd.

The Preliminary Budget

by LEROY D. OWEN
Industrial Development,
LeRoy D. Owen Co.

LUNCHEON SESSION

Site Selection

by GEORGE VERNON RUSSELL, Architect

AFTERNOON SESSION

Why Preliminary Plans?

by C. DAY WOODFORD, Architect,
Parkinson, Powelson, Briney, Bernard
& Woodford

General Layout and Land Use

by S. KENNETH JOHNSON, Architect,
Daniel, Mann, Johnson & Mendenhall

Planning Flow of Operations

by EDGAR R. PERRY
Consulting Industrial Engineer

DINNER SESSION

Jam Session.

Wednesday, March 3

MORNING SESSION

Intermediate Stage of Coordination

by SAMUEL E. LUNDEN, Architect,
Lunden, Hayward & O'Connor

Selection of Type of Construction and Materials

by JOHN E. MACKEL
Consulting Structural Engineer

LUNCHEON SESSION

Working Drawings and Specifications

by DAVID J. WITMER, Architect,
Witmer, Watson & Pidgeon

AFTERNOON SESSION

Selection of Types of Construction Contracts

by S. B. BARNES
Consulting Civil and Struct. Engineer

Codes and Regulations

by EARL HEITSCHMIDT, Architect

Construction Procedures

by GEORGE E. BRANDOW
Consulting Struct. and Civil Engineer

DINNER SESSION

Jam Session.

MATERIALS HANDLING road show

AN INDUSTRIAL road show to be staged by the Yale & Towne Manufacturing Co., Materials Handling Division, will play in the Los Angeles area on March 3 and 4. It will feature Yale lift trucks, hoists and newest materials handling methods. Performances will be held at 1:30, 3:30 and 8:00 p. m. daily at the James P. Kinney Co. premises, 5141 Telegraph Road, Los Angeles, distributors for Yale & Towne in the Southwest.

The show will arrive from Albuquerque and Phoenix in time to set up in San Diego, February 23-24; Long Beach, March 1; Los Angeles, March 4-5; Fresno, March 11-12; San Francisco, March 16-17; Eureka, March 23-24; and will then continue through Oregon and Washington.

BLIND FASTENER is self-sealing

A PAIR of Boeing Airplane Company engineers, Stanley E. Rea and Kenneth Williamson, have developed a self-sealing blind fastener, believed to be the first of its kind.

The structural fastener is composed of four pieces—a shell, chambered cap nut, expandable nylon collar and internal tightening screw. Installed in the hole, the shell is held by a special wrench while the tightening screw is rotated, swaging the nylon over the shell onto the structure and pulling the structure together.

Primarily designed for use in aircraft fuel systems, the new device is expected to provide weight savings through elimination of heavy sealants.

ENGINE TESTS for Army

WETMORE HODGES Associates, Inc., Redwood City, has recently received a new contract for more than \$85,000 for on-the-road testing of various makes of gasoline engines.

In order to use commercially available liquid-cooled truck engines, it is necessary to evaluate such engines by performance tests and to establish relative ratings for installation in military vehicles. The new contract calls for extensive stationary tests of various commercial engines. Each engine will be given two consecutive 500-hour tests. Before and after these tests, the engines will be disassembled and inspected to determine the performance data and wear characteristics.

FIELD-ERECTED HORTON TANKS



for storing
CAUSTIC SODA

The two 30-ft. diam. by 30-ft. tanks illustrated above are used to store liquid 50 per cent caustic soda at the Stauffer Chemical Company's plant at Henderson, Nevada.

The above tanks are a typical example of the type of flat-bottom field-erected steel tanks that we are equipped to build. We also fabricate and erect elevated water tanks; spherical, spheroidal, and cylindrical pressure tanks of carbon steel; and special plate structures of aluminum, stainless steel and other corrosion-resistant materials. We have facilities for pickling and painting carbon steel by the Horton phosphoric acid process and equipment for x-raying and stress-relieving. Write our nearest office for further information or quotations. There is no obligation on your part.

CB&I FIELD WELDING SUPERVISORY SERVICE

The Foreman and crew of every structure we build is assisted by a welding expert, assigned by our Field Welding Supervisory Service, who helps qualify welders, check equipment, inspect welding procedures and cut and grade plugs from welded joints.

The CB&I Field Welding Supervisory Service, which is yours at no extra cost, assures you of the best welded steel structure your money can buy. Don't be satisfied with less.

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Havana	402 Abreu Building
Houston 2	2164 C & I Life Building

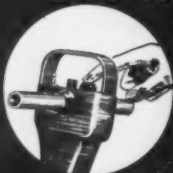
Los Angeles 17	1570 General Petroleum Building
New York 6	3334-165 Broadway Building
Philadelphia 3	1666-1700 Walnut Street Building
Pittsburgh 19	3267 Alcoa Building
Salt Lake City 4	568 West 17th South Street
San Francisco 4	1578-200 Bush Street
Seattle 1	1369 Henry Building
Tulsa 3	1667 Hunt Building

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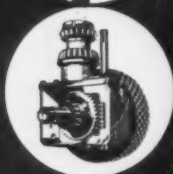
4 Big Reasons

why you should buy a

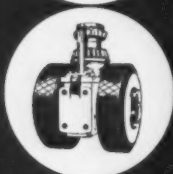
Hydro^Lectric LIFT TRUCK



CONTROL COMPLETE
at your finger tips



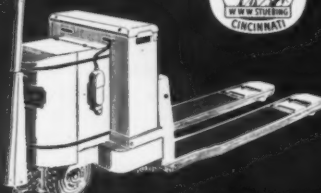
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TWIN DRIVE WHEELS
with differential for ease of steering and good stability



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completely enclosed—highly efficient easy accessibility



Compare the Hydrolectric features with any other "Driver Lead" Lift Truck. The Hydrolectric quality of construction merits your inquiry. Two driving wheels instead of one—50% easier steering—ease of maintenance.

Write for Catalogue #35 today showing various models and their features. NOTE: The Dyna-Dual Power Unit is interchangeable on all models.

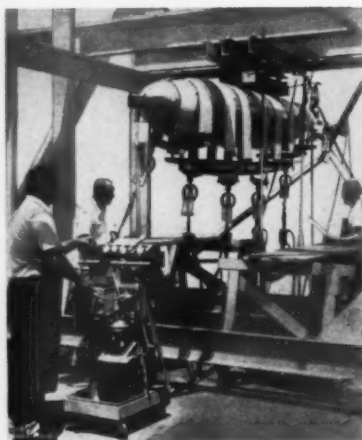
LIFT TRUCKS

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EFFICIENCY KINKS



JETTISONABLE fuel tank ready for test.

HYDRAULIC SQUEEZE tests aircraft parts

AIRPLANE jettisonable fuel tanks and other external stores components undergo a "squeezing" test at Pastushin Aviation Corp., Los Angeles, designed to determine strength on a static test stand developed by the firm's research engineering staff.

The test stand consists of a strong welded and bolted structural frame which supports the structure to be tested, a hydraulic system to generate the load, a series of load straps which apply the loads, and dynamometer rings to read the loads. Adjustable to accommodate testing of any size external fuel tank or streamlined shape, the structural frame allows the component to be mounted for test in the same position, and to use the same attach fittings as on the airplane.

Resultants of horizontal and vertical inertia and aerodynamic loads resulting from flight maneuvers are distributed over the length of the test article by flexible load straps. Applied loads are read at 2 airload and 10 inertia load application points by calibrated steel dynamometer rings.

The hydraulic system consists of a battery-operated hydraulic pump and hydraulic struts and valves to control each strut. The struts apply the loads to the straps and are linked by flexible hydraulic lines to a mobile cart containing the hydraulic control panel, and the motor and pump unit.

Pastushin's current tank test programs are for sonic and trans-sonic flight conditions resulting in applied loads from 8 to 16 tons with corresponding skin area loads up to 1,600 lb./sq. ft.

Contributions wanted

For each contribution to Efficiency Kinks which the editors feel merits publication, "Western Industry" will be happy to pay \$5. Please send in any details of how your plant solved some problem of design, production, maintenance, or process.

We are particularly interested in ideas that contribute to the efficiency of production and the reduction of operating costs, novel or new methods of pollution reduction and waste utilization as well as adaption of old tools and processes to do new jobs.

Send all contributions to Efficiency Kinks Editor, 609 Mission St., San Francisco 5, Calif.



HAND SCALE speeds fire extinguisher weighing.

SMALL SIZE SCALE for large scale savings

THE WEIGHING of 209 fire extinguishers once a week to make sure they contain the proper volume of CO₂ used to be a three-day job at Food Machinery and Chemical Corp.'s ordnance division, San Jose, Calif.

Thanks to the ingenuity of Fred Proud, FMC maintenance department employee, this same job is now accomplished in only four hours.

Proud used to drive a fork-lift truck,

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We are BEE Mold and Die, Inc. of Phoenix, Arizona. We're in Phoenix because it is the heart of a skilled labor market—one of the few places left where you can find the old-time craftsman, the man who takes pride in his work on a job well done, who will bend his skills to the intricate work that **you** demand from us. We are equipped with the most modern and up-to-date tools and machinery available. And we're ready to do a perfect and exacting job for you.

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We custom-manufacture molds and dies for the rubber, plastics and metal casting industries. We devote our entire effort to this single objective. We help relieve your production bottlenecks by supplying you with the molds and dies you need—as fast as a perfect job can be turned out—and as economically as possible. The quality and precision of the tools we make are guaranteed. We deliver **F.O.B. your plant.**

Our nation-wide staff is ready to serve you.

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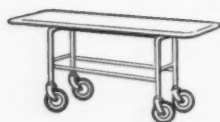
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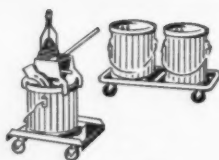
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DISH TRUCK



MOP TRUCKS



HAND TRUCK DRUM TRUCK



FOR GENERAL USE



FURNITURE TRUCK



KEG TRUCK

TRUCK Selection Chart



CANVAS BAG TRUCK



TANK TRUCK



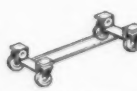
PLATFORM TRUCKS



BOX OR CRATE
DOLLY MILK CRATE
DOLLY



REFUSE CAN
DOLLY



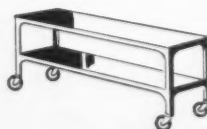
PIANO DOLLY



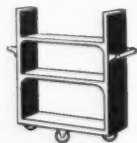
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LINEN SERVICE TRUCK



MARKING TABLES



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"LIFT JACK" MATERIAL HANDLING SYSTEM



LOAD 'EM UP, JACK 'EM UP AND ROLL



STACK 'EM UP

EFFICIENCY KINKS

... Begins on page 54

loaded with a pallet and large cumbersome scale, around to each extinguisher station to make this weekly volume check. Now he carries a lightweight, \$18 hanging scale for the same purpose. The small hand scale is hung from the extinguisher bracket and the extinguisher is attached to the scale for weighing.

Besides saving 2½ working days, Proud's job is easier and the valuable fork-lift truck is released for other work.

NEW CIRCULAR seam welder

A NEW welding machine developed at Solar Aircraft Co. in San Diego, is able to replace seven spot welders, costing a total of \$49,000. The "roll-welder" is used to automatically make circular seamwelds on J47 jet engine exhaust cone assemblies. Designed and built at a cost of \$14,000, the machine joins the afterburner fuel manifolds to the engine exhaust cone.

Cycle time for the weld operation has been cut almost 80%, from 4 hours to 45 minutes. One man operates the unit where formerly seven operators were needed. Handling of parts has also been significantly reduced. In operation, the rollwelder makes a 3-in. diameter seamweld around the support bosses of the fuel manifold. Usually in resistance welding the electrodes remain stationary while the part being welded is moved. However, in the new unit the seamwelder head is the moving member and constitutes the upper electrode. It automatically rolls around a circular path while the work remains stationary.

Another unusual aspect of the welding machine is that the moving upper electrode carries approximately 14,000 amperes through a one-half inch diameter shaft and a floating joint.

The lower electrode is essentially an air-operated clamping fixture. After positioning the work and closing the lower electrode, the welding operation is completely automatic. Welding speed is adjustable from 8 to 48 in. per minute.

Versatility has been stressed in the design, and the special tool can be removed and replaced by conventional tooling in 30 min. This converts the machine to a standard universal seamwelder.

This piece of equipment is a medium series, 36-in. throat, 150-kva. transformer, low inertia head seamwelding machine.

INTRODUCING

SPEEDEX

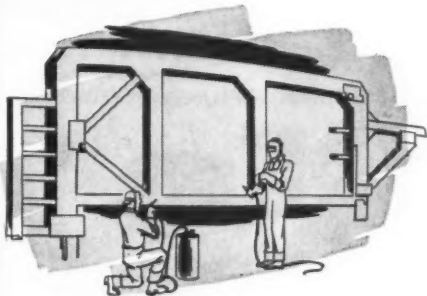
the new **MUREX** "Contact" Electrode



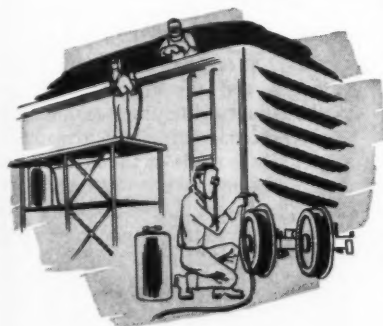
— crowning achievement in the use of powdered metal in Murex electrode coatings over the past twenty years.

● *Very high deposition rates—up to 25% higher than regular mild steel electrodes—effects real savings in welding costs.*

● *Easy to use—employ drag technique if desired, or use free arc as with conventional electrodes.*



● *Smooth, steady arc on A-C or D-C—little spatter—easy slag removal.*



● *Strong clean welds—85,000 to 90,000 psi tensile with 15% to 20% ductility—good surface appearance—fine ripple—practically no undercutting.*

METAL & THERMIT CORPORATION 100 East 42nd St., New York 17, N. Y.

Gentlemen:

Please send me technical data on "SPEEDEX" ☐ We would like to see "SPEEDEX" demonstrated. Call us for a convenient time. ☐

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MUREX ELECTRODES • ARC WELDERS • ACCESSORIES

how
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processes

And perhaps one of the many Maas chemicals can help improve your product or process. Write today for folder describing the Maas line.



Maas Hypo gives better results in steel treating baths.



And Maas is the leader in photographic chemicals—hypo—carbonate—sulfite—and other photo pure chemicals.



Maas Hypo gives better quality at less cost to leather tanners.



Maas Hypo aids with coloring of brass and copper.



Maas Hypo is used to assist in bending and forming wood.



Maas Hypo is found to be a most economical means of separating starch from gluten in flour.



Maas Hypo aids soapers with the manufacture of cleaning compounds and soap.

Maas

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HOLLOW FRAMING has dual purpose

HOLLOW FRAMING of the Alaska Copper and Brass Company's new 2-story Seattle office building doubles as a warm-air heating system.

Fresh air at 110 deg. F. is blown from an attic heater into the top of five hollow steel box columns, down to hollow main beams, in through a cellular second-floor slab and out through ceiling grilles.

Return air enters similar hollow columns around the perimeter of the building for passage back to the heater or exhaust. This integration of structure and mechanics resulted from close architect-engineer consultation during the early stages of design.

Separate duct work was eliminated, saving considerable space as well as time and money. Also, useful heat comes from the hollow columns, beams and floors. Cool summer ventilation is possible by simply blowing in fresh air.

The building frame is stronger since the box column provides a greater radius of gyration and offers more efficient structural support than conventional H-columns of the same cross-sectional area. However, this is not likely to save on framing costs as shop fabricated box sections are more expensive than rolled members.

STRAIGHTENING method for steel structures

AT A RECENT meeting of the Puget Sound Chapter of the American Society for Metals, Joseph Holt discussed "Contraction and Expansion as Friends in Need."

Mr. Holt emphasized the many advantages and the simplicity of his method of straightening steel members once the basic principles are understood. Use is made of the great forces available when metal contracts or expands, and these forces are controlled in direction and magnitude by the pattern and amount of heat that is applied.

The only equipment used is an oxy-acetylene torch. No jiggling or fixturing is used; by ingenious use of heat, areas of the member can be made to serve this purpose and maintain rigidity even though the member is under load. It is extremely important that each job be analyzed in detail so that the type and magnitude of loading for each member in the structure is known. Otherwise results might be disastrous.

INGENIOUS SYSTEM heats plant

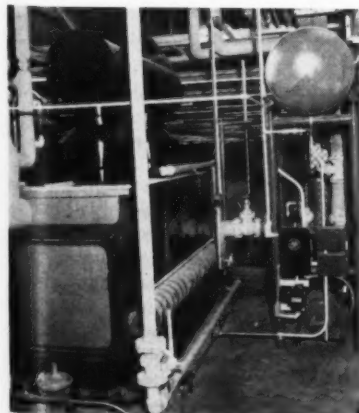
CONSOLIDATED Vultee Aircraft Corporation, currently producing guided missiles, managed to kill a number of birds with one stone when they installed 19 W-55 National gas boilers throughout their entire manufacturing facility at Pomona, California.

All 19 gas-fired boilers were installed on the roofs of the plant's lavatories. These boilers take up no floor space; operate efficiently under straight natural gas or, in an emergency, a propane-air mixture; are strategically located to heat the entire plant; and provide adequate supplies of domestic hot water for use in the lavatories below.

Due to the nature of the guided missile program, it is of vital importance to have a promptly available supply of propane-air, if for any reason there is an interruption in natural gas transmission. The standby equipment for the factory space heating system allows that gas supply to be put on an interruptible service basis with an according reduction in rates. These 19 boilers were part of the \$1,500,000 heating and air-conditioning system. The boilers have a net rating of 1,212,300 Btu. per hour, which is equivalent to 8,080 sq. ft. of hot water radiation.

Water at 180 deg. F. comes from boilers and is delivered to coils in the air conditioning system. These coils are in fan houses on the roofs of the plant buildings. The whole air conditioning system is automatically operated and is designed to function within a 2 deg. temperature differential. Six inches of reinforced concrete, plus 2 in. of magnesia block, separate the gas boilers from the ceilings of the lavatories.

A GAS boiler supplying heat and hot water, Convair's guided missile plant, Pomona.



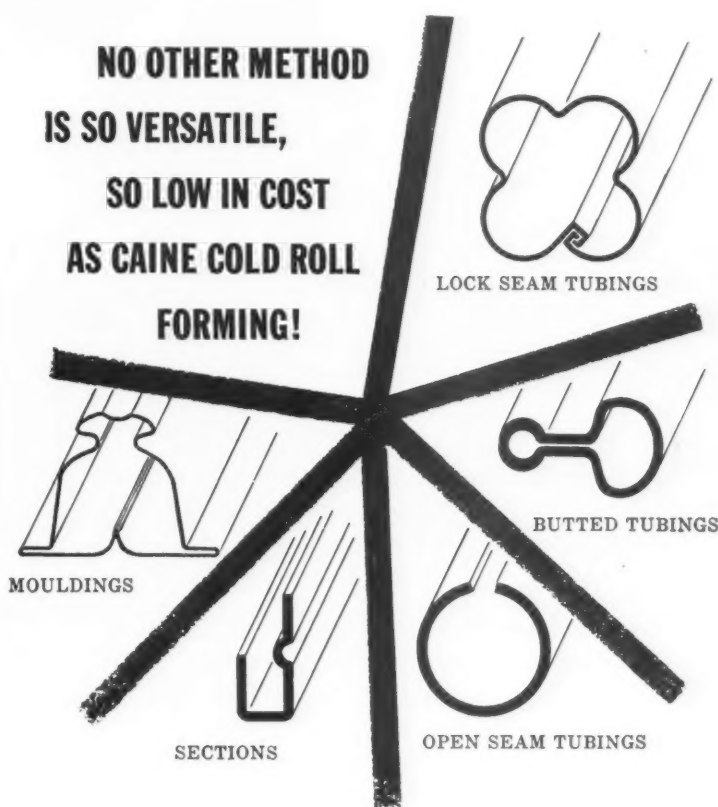
WESTERN STATES power show

THE THIRD annual Western States Power Show and Conference will be held in the Crystal Room of San Francisco's Hotel Whitcomb on Friday and Saturday, March 5 and 6, from 10 a. m. to 10 p. m. daily. This presentation of equipment and materials used in industrial power plants will be open to all interested parties without charge. At this writing the following San Francisco firms had signed up for booths:

American District Steam Co., Garratt-Callahan Co., George R. Friederich & Co., West Coast Engine & Equipment Co. and Grinnell Co. There will be 41 booths in all.

Program

The program is as follows: Thursday night, members' dinner; Friday afternoon, 1 to 4 p. m., convention meeting; Friday night, 8 p. m., speaker, "Practical Applications of Atomic Energy," and a movie; Saturday morning, 10 a. m., convention meeting.



Your shape problem, no matter how unique, can cost less—at Caine! For cold roll forming is not only less expensive in quantity than any other method, but virtually unlimited in versatility. Sections and mouldings, lock seam, open seam, butted tubing, angles and weldings—whatever "shape" your product requires—can be cold roll formed faster, accurately, less expensively.

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4140

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by Bone saved 63%

on this part!



Specifications were high on this link made of 4140 alloy steel, and called for critical inspection.

Originally it was machined from a forging
... but at a cost of \$15.21.

By changing to the Bone investment casting shown here an overall saving of \$9.71 was made.

The part also was smoother, non-porous and dimensionally uniform. Total cost, including all machining, was \$5.50.

With its modern equipment and staff of engineers, metallurgists and craftsmen here in the west, Bone now precision casts non-ferrous alloys, low carbon and alloy steels, corrosion and heat resistant metals—all to micrometer tolerances. In addition, it has facilities for tool making and machining.

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OIL SAVINGS— Filtering will do it

AS A RESULT of making spectrographic analysis of lubricating oil at stated intervals, The Denver & Rio Grande Western Railroad has found it unnecessary to change the oil in its locomotives if the filters are properly maintained.

"As a matter of fact, we have found there is less engine wear if the oil is not changed, as new oil has an affinity for the metal in the engine," reported Wilson McCarthy, president of the company, to the Pacific Coast Transportation Advisory Board. "The manufacturer's guarantee specified that oil must be changed in these diesels every 30,000 miles, but they have waived this limitation for our railroad."

After every 300,000 to 400,000 miles the locomotives come in for an overhaul, and the oil is drained and put back into another locomotive.

"Our first diesels have gone over a million and a half miles and still have 96 per cent of the original pistons and liners," said Judge McCarthy. "We have used this technique with our truck operations, and have run trucks as high as 118,000 miles without changing oil. If you had the proper facilities for inspecting the oil in your automobile, you would find that with your filters properly maintained you could run all summer without changing oil."

"One of the amazing new tools in our laboratory is the electron microscope. With it we have been able to discover which impurities in low grade residue fuels have made them unfit for use in diesel locomotives. We have also learned that these impurities can be broken up through the use of very low cost dispersants."

"Small quantities of dispersants—about one pint to one quart per thousand gallons—transform the lower grade oils into efficient diesel fuels. Possible savings to our railroad can amount to as much as three-quarters of a million dollars annually."

BETTER STEEL from better scrap

A PROGRAM of cooperation between scrap dealers and Columbia-Geneva Steel Division, United States Steel Corporation, has brought about great improvement in the condition of the scrap received. The improved scrap preparation has resulted in an increased tonnage of steel output per furnace operating hour.

The program encouraged scrap

dealers to visit steel plants when the poor quality of the scrap received began to interfere seriously with production in 1951. Scrap dealers were shown the effects on operations of poorly prepared scrap identified as coming from their yards by a color marking system. At the same time, steelmen visited scrap yards to observe at first hand the problems of the dealers and to gain experience in their problems.

Among benefits are a reduction in the number of poorly prepared bundles of scrap, fewer impurities mingled with the material received and better sizing of individual pieces by the dealers.

BAKERY PRODUCTS freezing studied

THE REFRIGERATION Research Foundation reports that certain fundamental research questions on the freezing of bakery products are to be studied at the Western Regional Research Laboratory, Albany, California. The study may lead to an investigation of the increased utilization of wheat.

At the annual meeting of the foundation in May 1953, the director emphasized the present need for research on freezing of baked foods is very great. He said that estimates of returned stale bread alone indicate that they would be sufficient to provide bread for a city the size of Philadelphia if collected from the entire country. Moderate sized companies have paid as much as \$200,000 per year in premium rates for overtime and holiday time of workers, and the baking industry faces immediately a five-day week.

Examples of the many practical problems facing the baking companies that consider freezing and frozen storage are: What is the best and most economical method for freezing bread? Should bread be frozen before or after it is packaged and before or after it is sliced? Are there any other limitations such as type of icing used on certain foods, type of custards used, etc.

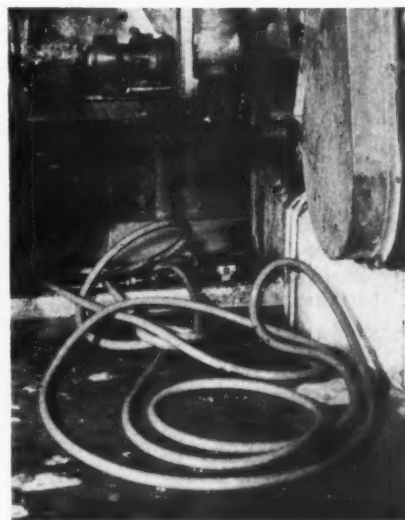
Major problems at present appear to be economic ones. Can a baker prevent losses from leftovers or from high labor costs by freezing a portion of his production? Can a refrigerated warehouse provide the kind of facilities and service that will aid the baker?

Some baked products have a comparatively low density, and mutually equitable freezing and storage costs may present a difficult problem to the two industries involved. It would seem that if this type of business is to be developed it must first be considered in many local situations.

GOODALL *Demonstrates* the Economy of **QUALITY** *in Every-Day Service...*

AIR HOSE...for All Pneumatic Tools

The Goodall line includes Air Hose of various styles in wrapped duck, molded-and-braided and sheeting constructions... covering the full range of pneumatic tool applications... from chipping to heavy-duty rock drilling. "Subway," "Mine King," "37" and "Chipper" are names that mean *maximum* in every characteristic desirable under the service conditions for which each brand is designed.



WATER HOSE For Production and Wash-up

Name any application for Water Hose, and you'll find a Goodall brand that will fill the bill with outstanding reliability and economy. "Buckskin" and "Bellwood" will meet practically all cold-water requirements. Use "CLOVER-LEAF" Creamery Hose for scalding water wash-up. Other special-purpose constructions include Paper Mill, Greenhouse, Street and Sewer Flushing, Car Wash and Deck Hose.

Contact the nearest Goodall branch for complete information on the hose mentioned above; additional brands in the same categories; or any other industrial rubber products you may need—welding, steam, acid, oil or fire hose; conveyor, transmission or elevator belting; expansion joints; packings; clothing, gloves and footwear for plant or laboratory.



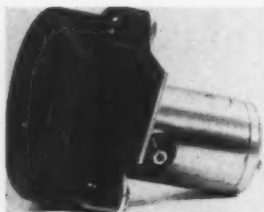
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NEW EQUIPMENT & MATERIALS

USE RIP-OUT POSTCARD for more information on products introduced this month

1 Small type motor and blower

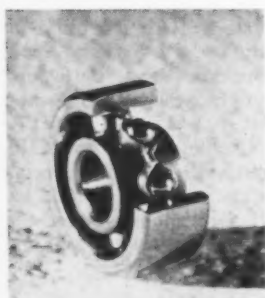


Here is a new permanent magnet D.C. motor and centrifugal blower in miniature size. Blower weighs just 7½ oz. and has air volume of 20 CFM in free air. It measures approximately 2⅞ in. at blower end. Blower is 1¼ in. in diameter. *For more information, circle key number on rip-out postcard.* Mission-Western Engineers, Inc.

2 For high temperature—corrosive service

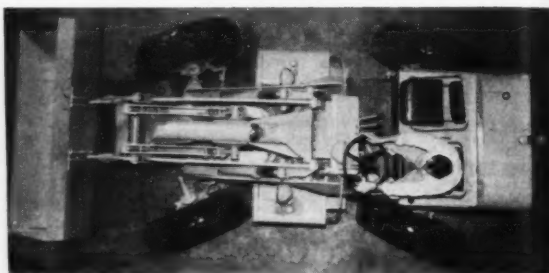
Special bulletin 8300 ASCO solenoid valves are constructed with either steel or stainless steel bodies. Both types have stainless steel trim throughout and can handle usually corrosive gases and liquids. When equipped with high temperature coils, valves will handle gases of 450 deg. F. Often used for pilot control of diaphragms and for applying and exhausting pressure from single or double acting cylinders, valves are "factory set" for desired flow conditions. *For additional information, circle key number on rip-out postcard.* Automatic Switch Co.

3 Better bearing



New Micro R2 is a bearing featuring a ribbon-type, balanced, cone-controlled retainer that cannot wind up, hang up, or fall out. Result is a low and repetitive starting torque in one bearing and from one bearing to another. Bearing is available in flange-type with straight OD, which provides simplified housings, easier mounting and solid seating. *For details, circle key number on rip-out postcard.* New Hampshire Ball Bearings, Inc.

4 Quick turn in materials handling



Baker-Lull's Shovel loader, with an inside turning radius of only 7 ft., 6 in., will get you around corners in a hurry. Equipped with positive four-wheel drive and designed to eliminate need for a center differential in transfer case, unit's hi-flotation tires and high under-clearance permit maximum efficiency. Operator's control is increased by power steering on all four wheels (optional). *Circle key number on rip-out postcard for more information.* Baker-Lull Corp.

5 For precise air pressure regulation



This new pilot-controlled air pressure regulator is designed for extreme precision in air control over a wide operating range and is said to reduce line pressures up to 400 psi. to working pressures from 2 to 120 psi. New unit, Series 20AC00, provides a pilot regulator and a pressure regulator in an integral unit. *For a new catalog sheet showing firm's complete line of regulators, circle key number on rip-out postcard.* C. A. Norgren Co.

6 Conveyor belt cleaning the efficient way

Suggestions for mounting cylinder brushes for conveyor belt cleaning which are driven by a power take-off arrangement from conveyor belt itself, are being offered by Fuller

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Brush Co. Fullergript cylinder brushes are readily adaptable to this new system. Designed for specific cleaning tasks, brushes are made in standard conveyor widths with a variety of core and shaft sizes and fill materials. For specification sheet complete with diagrams, circle key number on rip-out postcard.

7

Magnesium conveyor combines strength and utility



A new, portable roller conveyor system, fabricated entirely of magnesium, is claimed to combine capacity-rated strength and utility with magnesium lightness and greater ease of handling. Designed primarily for use where portability and conveyor job-spotting is a major consideration, it is claimed that one man can set up, dismantle or relocate this conveyor system in nothing flat. For additional information, circle key number on rip-out postcard. Magline, Inc.

8

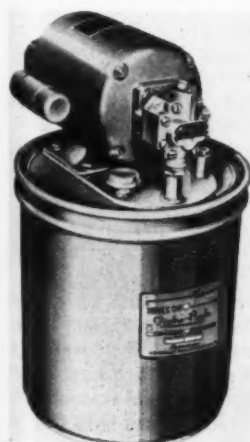
New line of powered hand trucks



"Powrworker 26" line of powered hand trucks, a new addition to materials handling field, features short overall length. Design features are claimed to add up to unusual maneuverability, high load stability, operator convenience and simple, quick maintenance. Special safety features have also been included. For detailed information on Powrworker 26 line of trucks, circle key number on rip-out postcard. Clark Equipment Co.

9

Pumping unit for "Modernair" equipment



DU Series pumping unit is designed for use with Modernair components and systems to provide "on-the-spot" low pressure hydraulic power and volume output, suited to numerous individual installation requirements. Unit comes complete with motor, five-gal. reservoir, breather, dip stick, overload protection and capacitor, relief valve set for 200 psi, and needle bearings for continuous service. For more information and a test data sheet, circle key number on rip-out postcard. Modernair Corp.

For Quickest Pipe Threading by hand...it's "OOR"

RIGID



Popular Extra-Handy OOR Threads 1/8" to 1" Pipe Fast and Easily

- You just can't beat these small drop head dies for quick easy pipe or conduit threading.
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- Precision-cut alloy dies reverse easily for close-to-wall threads—no special dies needed.
- OOR and OR 1/8" to 1"; 111R and 11R, 1/8" to 1 1/4"; 12R, 1/8" to 2". Free carrier with sets. Every threader fully work tested before shipment. Buy them at your Supply House.

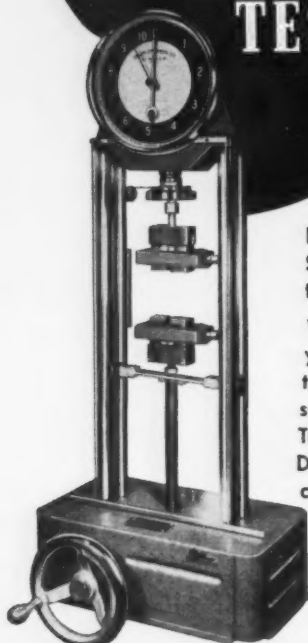
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as 125,000 lbs. P.S.I.

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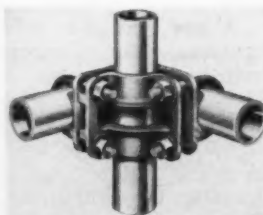
14620W KESWICK STREET, VAN NUYS, CALIF., (Suburb of Los Angeles)



NEW EQUIPMENT . . . Begins on page 64

10

Tubing clamps will save you money



Tubular structures can be quickly and inexpensively erected using standard tubing or pipe with "Tube-Strut" clamp system—no threading, welding, skilled help, special tools or sections are required. This means lower cost for materials and installation labor. Tube-Strut coupler performs all structural functions in a single unit with no positioning limitations. For literature and complete information, circle key number on rip-out postcard. Tubular Structures Corp. of America.

11

Portable sandblasting gun features patented gunhead

Jet-O-Blast is an abrasive gun said to offer new speed and economy for shipyards, auto body repair shops, foundries, aircraft plants and machine shops where cleaning or preparing of hard surfaces is a problem. Gun is abrasive adaptable and is claimed usable for everything from frosting glass to removing tough welding slag. For additional information, circle key number on rip-out postcard. Safetee Products Co.

12

Extractor for cleaner spray painting



AO-120 extractor is an improved oil and water extractor for use on spray painting air lines. Said to effectively trap oil, water, and rust particles, it prevents impurities from reaching spray gun and eliminates a major cause of rejects. It also puts an end to clogging of air passages in spray gun nozzles. Features claimed are: more efficient air cleaning, easier operation; and longer life and lower maintenance costs. For bulletin AO-120 giving full information on this new product, circle key number on rip-out postcard. Binks Manufacturing Co.

13

Hot stuff for sanders

The Skil Corp. places two new disc sanders on market, a 7 in., standard-duty unit, Model 851, and a 7 in., heavy-duty unit, Model 852. These new tools will be welcomed "anywhere top sanding, grinding and wire brushing results mean more time and money saved." Special features are: a new front handle location; short length and light weight; and low maintenance cost. A high speed of 4,500 rpm. gives

Don't Scatter Your Motor Starters Use A-B Multi-Unit Control Centers

Group your motor starters together in Allen-Bradley Bulletin 798 Multi-Unit Control Centers and enjoy these five big benefits:

- 1—Centralized electrical maintenance
- 2—Increased safety to all personnel
- 3—Improved plant appearance
- 4—Reduced need for special starter enclosures
- 5—Greater flexibility in making plant changes

The whole story is told in Bulletin 798. Please write for copy.

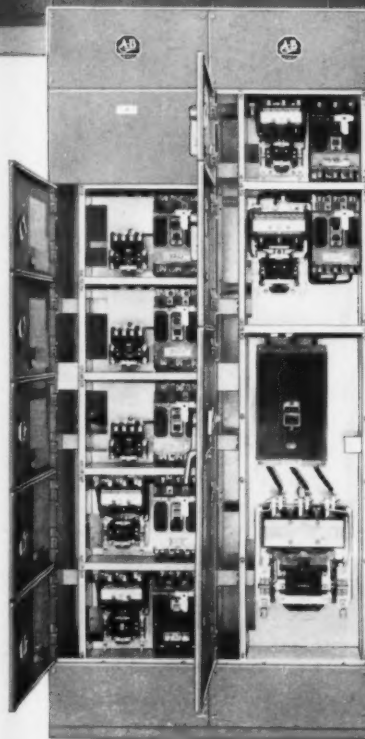


Allen-Bradley Multi-Unit Control Centers Assure Continuous Production at Basic Refractories

In Maple Grove, Ohio, Basic Refractories, Inc., produces a large tonnage of refractory materials, using 390-foot, motor driven kilns with 200 hp fans. It is a continuous process and all motor controls are centralized in 8 large A-B Multi-Unit Control Centers, doing away with scattered controls requiring dust-tight enclosures.

Since Allen-Bradley double break, silver alloy contacts require no filing, cleaning, or dressing, the need for inspection is practically eliminated.

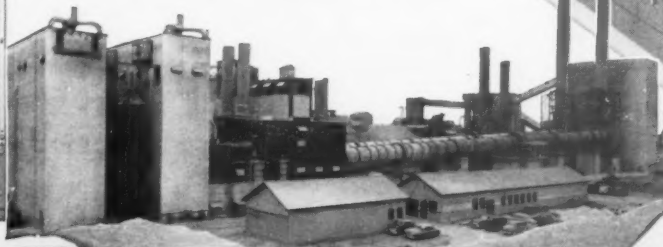
Allen-Bradley Co.
1316 S. Second St., Milwaukee 4, Wisconsin



2-Section Allen-Bradley Control Center with Sizes 1, 2, 3, & 4 across-the-line starters... all with ITE circuit breakers.



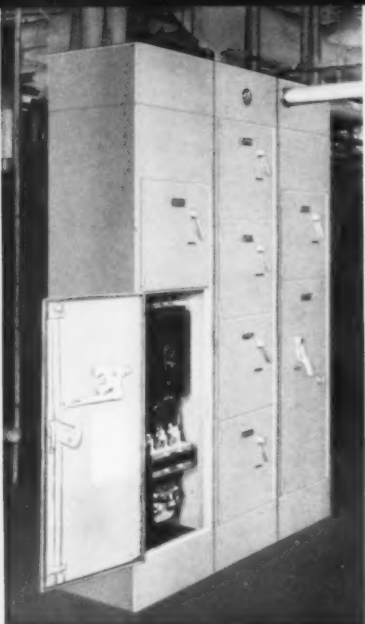
8-Section A-B Control Center for grinding and screening controls.



ALLEN-BRADLEY

BULLETIN 798 MULTI-UNIT CONTROLS

QUALITY



A 3-section, 8-unit, Allen-Bradley Multi-Unit Control Center operating a large electric furnace. One door open to show circuit breaker.

Bulletin 798 Multi-Unit Control Centers

NEATER • SAFER • INTERCHANGEABLE • ADAPTABLE

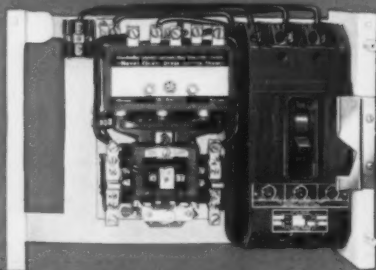
• There is a strong trend in modern plant layouts to concentrate motor controls in "control centers" like Allen-Bradley Bulletin 798 Multi-Unit Controls.

Bringing your motor controls together in one spot makes for more systematic inspection. It also prevents unauthorized changes in fuses, circuit breakers, and timing relay adjustments. It slicks up your plant and gives it a more modern, streamlined appearance. In fact, it often saves you the cost of providing special enclosures because control centers can be installed away from processes that are dusty, wet, or hazardous.

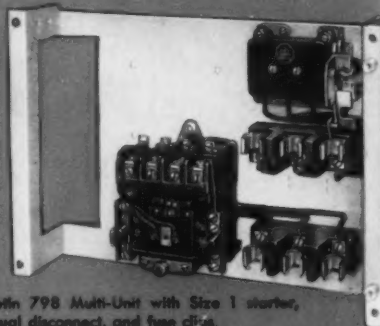
Let us send you an interesting, illustrated, 28-page booklet on Bulletin 798 Multi-Unit Controls. It shows the flexibility and adaptability of these versatile control units.

Allen-Bradley Co.
Milwaukee 4, Wisconsin

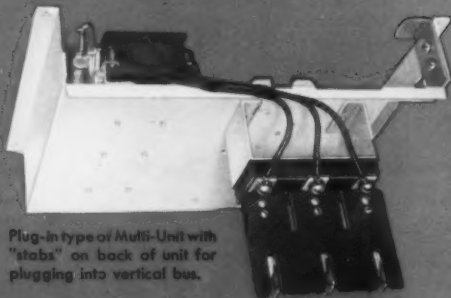
1316 South Second Street



Bulletin 798 Multi-Unit with Size 3 solenoid starter and circuit breaker.



Bulletin 798 Multi-Unit with Size 1 starter, manual disconnect, and fuse clips.



Plug-in type of Multi-Unit with "stabs" on back of unit for plugging into vertical bus.



Fixed-connection type of Multi-Unit with permanently wired connection to bus.



ALLEN-BRADLEY
BULLETIN 798
MULTI-UNIT CONTROLS
QUALITY

Motor starters are removable as a unit, making it easy to adapt control center to changes in plant layout.

peak efficiency and faster results. For more information, including specifications, circle key number on rip-out postcard. The Skil Corp.

14

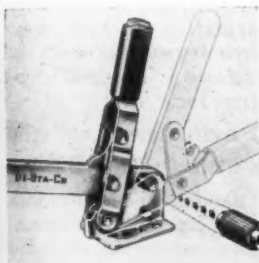
Versatile variable speed drives

Type GV Speedranger line of electronically-controlled variable speed drives range from $\frac{1}{8}$ to 10 hp. Versatility is claimed for these drives because electronic control permits speed to be made responsive to signals based on speed, load, current, voltage, pressure, light, temperature or time. Type GV has basic speeds of 2400, 1750 and 1150 rpm. Remote, stepless speed control is provided by knob rotation at an operator's station. Circle key number on rip-out postcard for more information. Master Electric Co. 609

15

New "De-Sta-Co" clamp design

There is now a new type of bushing for series 210, 220, 228 and 240 "De-Sta-Co" quick acting production toggle clamps. Said to offer longer life under repeated stress and volume operations in 500 to 800-lb. pressure range, bushings run full length through clamp bars to provide more bearing surface. Bushings are serrated and locked in clamp bars so that they will not turn and work loose. For detailed information, circle key number on rip-out postcard. Detroit Stamping Co.



16

Weight indicator for cranes or hoists

This crane weight indicator type S-6 is a small, low cost, economical, rugged weight-measuring device which can be attached to boom cranes, bridge cranes, or overhead hoists having capacities up to 50,000 lbs. It is said to be always ready to use with no sitting down of load, waiting for special rigging, or time lost moving to stationary scales. For more information, circle key number on rip-out postcard. Martin-Decker Corp.



17

Adjustable V-belt for D and E drives

Veelos TD and TE link V-belts are made of plies of especially treated high-tensile strength canvas duck, joined by riveted studs with removable cup-washers and T-screws. This construction is said to give greater strength and durability at all key points yet enables belts to be coupled and uncoupled easily. Regular rubber coated belts are available for general services, and oil proof belts are

HERE'S HOW OAKITE SOLVENT DETERGENTS DO YOUR HEAVY METAL CLEANING

WATER-LOVING →

BOMBS AWAY

← OIL-LOVING

Each molecule of surface-active agent in the solvent detergent has an "oil-loving" end and a "water-loving" end.

ANCHORS AWEIGH

OIL FILM

SOLID DIRT

METAL SURFACE

Each "oil-loving" end hooks itself to the oil in dirt on a metal surface.

RINSE WATER

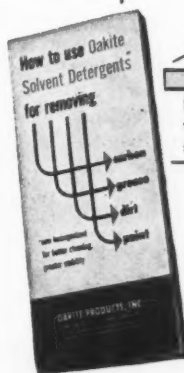
DIRT'S AWAY

OIL FILM

SOLID DIRT

METAL SURFACE

Each "water-loving" end hooks itself to rinse water. Result: Solvent, oil and solid dirt are swept away in the rinse.



Oakite solvent detergents help you remove drawing and buffing compounds and other thick, heavy, stubborn oils and greases. They offer economy, safe cleaning for all metals, rust prevention, reduction of fire hazards.

FREE For 24-page booklet describing these splendid precleaners and paint strippers, write to Oakite Products Inc., 1001 E. First St., Los Angeles, or 681 Market St., San Francisco, Calif.

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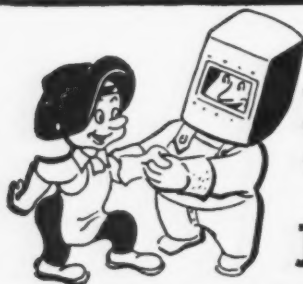


FREE—Just off press! Bulletin 26 has 20 pages of photographs, drawings, diagrams and text, showing the complete line of Farval systems. Send for it today.

● This new 20-page databook brings you up-to-date on centralized lubrication. Color drawings show step-by-step operation of the unique Farval Dualine valve. All types of systems illustrated—manual, heavy-duty automatic, light-duty automatic DC 20 and Farval Spray Valve. Also included are reports of user experience that indicate savings in oiling labor, lubricant, bearing expense and production time that you can expect on your Farvalized machines.

THE FARVAL CORPORATION

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Industrial Worm Gearing



**Ind-Air's
"Sparky"
Joins G.E.**

Good news for all users of welding supplies and equipment! Industrial Air Products Co. now, in addition to its many leading lines of welding equipment, has been appointed distributor by General Electric for their welding machines and electrodes.

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**INDUSTRIAL AIR
PRODUCTS CO.**

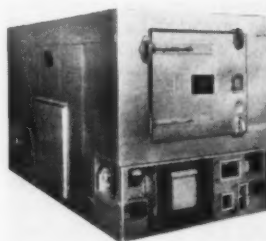
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MEDFORD, OREGON • YAKIMA, WASHINGTON

NEW EQUIPMENT . . . Begins on page 64

available for oily and high temperature drives. *For further information, circle key number on rip-out postcard.* Mannheim Manufacturing & Belting Co.

18

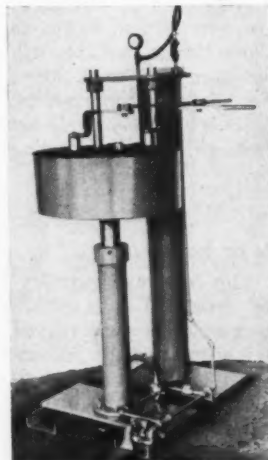
Portable ovens lower costs



This portable electric oven is designed for heating aluminum alloy spar rails, for continuous hot forming at a temperature of about 300 deg. F. It is on a portable platform and can be inclined at various angles for handling curved spars. Oven can be stabilized, in a certain location, by floor jacks. Thus oven can be moved to location needed instead of work being transported to oven location. Work chamber is 12x12x48 in. long. *For complete information on this oven, circle key number on rip-out postcard.* Industrial Systems, Inc.

19

Save face and freight with fitting tester



Testing pipe fittings with new Fern-Boaz testing machine before shipping can eliminate rejects 100%, saving cost of return freight and loss of prestige to manufacturer. Machine tests most commonly used pipe fittings and sizes from 1/2-in. to 2-in. I.P.S. with branch "Y"s included. It is said to detect even smallest pin holes or fractures. Equipment requires only a floor area of 2 ft. x 3 ft., 3 in. *For full details and specifications, circle key number on rip-out postcard.* Fernholtz Machinery Co.

20

For fastening equipment to concrete, brick or stone

Phillips self-drilling expansion shell (steel) is a cylindrical device with drilling teeth formed at one end and interior threads, at opposite end, for attaching a bolt or rod. After shell drills hole in stone or concrete, it is expanded in hole for use as an anchor. Catalog 53 will give you full details. *For your free copy, circle key number on rip-out postcard.* Martin Supply Co.

21

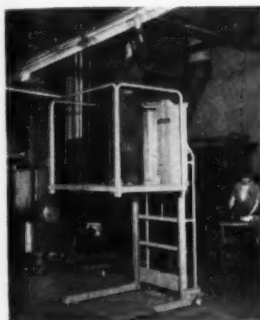
Scaffolding attachment makes maintenance easier

Scaffolding attachment, for Lewis-Shepard electric fork truck, may be used for inside and outside repair jobs, and for hard-to-reach trouble spots. Forks slide into sleeves on

scaffold's underside and hold it securely. A ladder, built into one side of structure, makes it easy to reach platform when forks are down. With remote control feature, maintenance man can raise and lower himself as desired. For more information, circle key number on rip-out postcard.

22

Now comes "The Bootstrapper"



Here is a lifting unit on which a man may raise and lower himself with a hand crank. With a 500-lb. capacity, 36 x 60-in. platform, and removable pipe railings, Bootstrapper is a cantilever type with hand winch mounted on carriage. It has caster steer with a foot-operated floor lock mounted between swivel casters, and comes with or without pipe lowering hinge to pass through doorways. For more information on this industrial equipment, circle key number on rip-out postcard. Service Caster & Truck Corp.

23

Flexible, inexpensive duct

"Portovent," for handling air, dust or fumes, is claimed inexpensive, easily-handled, and flexible. Easy to install,





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- WOODRUFF KEYS
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- TAPER PINS
- COTTER PINS
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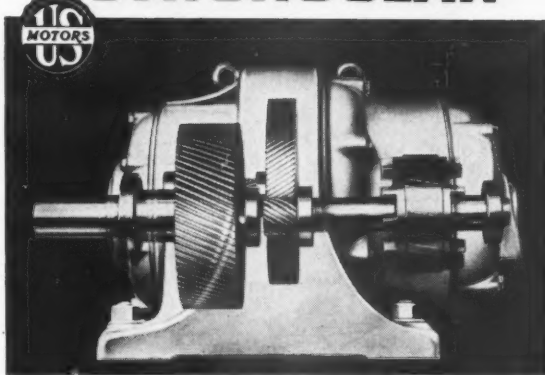
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Western Factory Sales Representative
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Geared Power SIMPLIFIED WITH **SYNCRGGEAR**



The motor that internally gears its speed

DON'T go to the expense of installing a gear box with extra coupling and guards to rig up slow speed for a motor. Install the U. S. Syncrogear motor and avoid extra contraptions. You'll simplify your power hook-up, save space, eliminate hazards and give your driven machine the most efficient power. The U. S. Syncrogear motor was one of the first complete integral power units, introduced 22 years ago. It's backed by experience, tested and proved performance and engineering "know-how" that only U. S. MOTORS can offer to those seeking the most dependable geared motor power.

SYNCRGGEAR ADVANTAGES

<p>Compact—rugged—quiet No external gear box No extra coupling Internally-geared Single unit on one base Completely housed Reduced frictional losses Permanently-aligned parts Super-hardened gears</p>	<p>Pyramidal supporting base Solid shank pinion Normalized castings Extra large oil reservoir Asbestos-protected windings In-a-line shaft Neat, streamline appearance Drip-proof surface</p>
---	--

U.S. SYNCRGGEAR MOTOR

4 TO 10,000 RPM.
1/4 TO 30 H.P.



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See Yellow pages for your local sales representative

NEW EQUIPMENT . . . Begins on page 64

transport, handle, and store, this product is available with inside diameters of four to 36 in. in any lengths. It can be cut satisfactorily in field. *For complete information, circle key number on rip-out postcard.* The Flexaust Co.

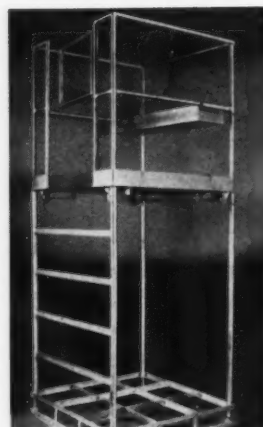
24

Band saw features "Jiffy" tires

Delta Power Tool division of Rockwell Manufacturing Co. introduces an improved version of its standard 20-in. band saw featuring rubber tires fused to pre-faced demountable steel rims. Use of these "Carter Jiffy Tires" is claimed to reduce machine downtime and eliminate need for facing and cementing. *For more complete information, circle key number on rip-out postcard.*

25

Safety work platform is easy, fast and safe



New and needed by industry is this mobile HECO safety work platform. Used in conjunction with a fork lift truck, platform is said to provide immediate and easy work access at any fork lift elevation. No set-up or erection is necessary, no need for scaffolding or ladders. Ideal for construction work, industrial plants, machinery repair, shop maintenance, aircraft factories and numerous other jobs, platform saves time and labor. *For further information circle key number on rip-out postcard.* Hamerslag Equipment Co.

26

Two sided stickiness

"Scotch" brand double-coated tissue tape No. 400 is an improved double-coated tape. It claims these advantages: a new protective line (tan rather than gray) is used to minimize loss of tackiness during storage; liner removal has been made easier; and tape, minus liner, is nearly 1-mil thinner than original tape. Designed for such jobs as mounting metal to metal, tape is now available in 1/4 to 20-in. widths on 36-yd. rolls. *Circle key number on rip-out postcard for complete information.* Minnesota Mining and Manufacturing Co.

27

Electrode speeds up welding

Airco "Easyarc 12" will weld mild steel at speeds said to double those obtained with conventional electrodes. Weld beads are smooth, and weld metal is strong, ductile, and X-Ray sound. Bulletin ADC 650 contains complete details on this electrode. *For your free copy, circle key number on rip-out postcard.* Air Reduction Pacific Co.

28

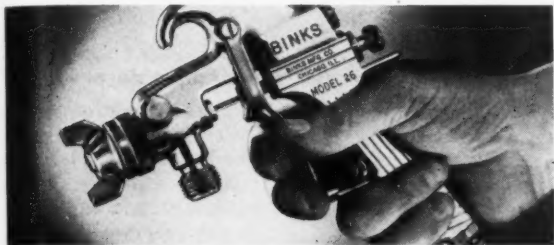
Put bacteria on your payroll

Bionetic is a dry stable powder of groups of preserved living microorganisms from natural sources, with enzyme systems and trace minerals to improve and accelerate biological processes. Produced in several types depending on type of problem, these industrious bacteria offer a new

approach to sludge digestion and waste disposal, and a possible answer to many industrial headaches. For descriptive literature or information on specific problems, circle key number on rip-out postcard. Ray W. Hawksley Co.

29

Fine finishing spray gun is lightweight and economical



Binks Model 26 spray gun is made of aluminum and weighs only 15 ounces. Handle and trigger are designed to fit even a small hand. Light weight and easy fit of this gun assures that women operators can use Model 26 for long periods. Nozzle set-ups, similar to those used on heavy-duty production guns, produce high quality finishes. Bulletin 26 presents a detailed description of Model 26. For your free copy, circle key number on rip-out postcard. Binks Manufacturing Co.

30

Have a "Weld-Bilt" for handling ease

"Weld-Bilt" lift trucks feature ease of handling, safety, and ruggedness. Some advantages include full 270 deg. lifting handle which permits load lifting from any angle

PETLEY PLANNING Solves YOUR LONG PARTS STORAGE PROBLEMS



Everyone who stores any kind of bar stock has a problem that Petley engineers (schooled for years in solving storage matters) can clear up most efficiently...



WEDGE-LOCK LONG PARTS BAR RACKS

are flexible enough to handle any type of bar stock and they're built especially strong to support the heavy loads and last practically forever.

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The man on the job likes Victor's

WIDER WORK RANGE



Using a VICTOR No. 310 torch butt with two S2 extensions and No. 8 type 4 tip, Joe Wyman (Shreve Welding Co., Oakland, Calif.) repairs cast iron heating boiler header with VICTOR No. 1 low fuming manganese bronze rod. Inset photo shows 5/64" build-up on undersize castings, done with same No. 310 torch but with No. 5 type 4 nozzle and VICTOR No. 6 square cast iron rod.

VICTOR'S wider work range pays off from the day you select your first VICTOR welding outfit on through a lifetime of reliable service. You buy the torch you need for your present work, add extensions, cutting attachments or special nozzles as they're needed. Result: top-quality equipment that's always perfectly matched to your needs!

**Whatever the job . . . welding, cutting,
heating, brazing, descaling . . . you'll start it quicker,
finish it sooner with versatile VICTOR equipment!**



LOOK FOR THE VICTOR DEALER SIGN
... ask him to show you why it costs
less to own and operate VICTOR.

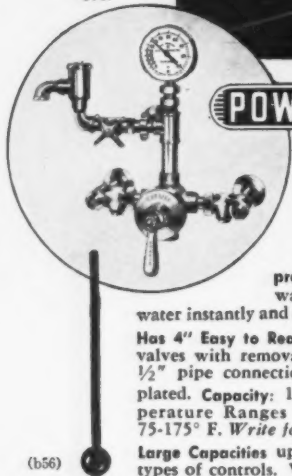
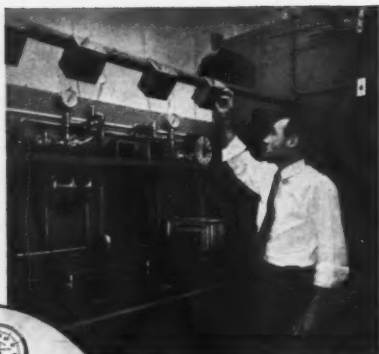
VICTOR EQUIPMENT COMPANY

Mfrs. of welding & cutting equipment; hardfacing rods; blasting nozzles.

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Water
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for Industrial
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Lens Polishing
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etc.**

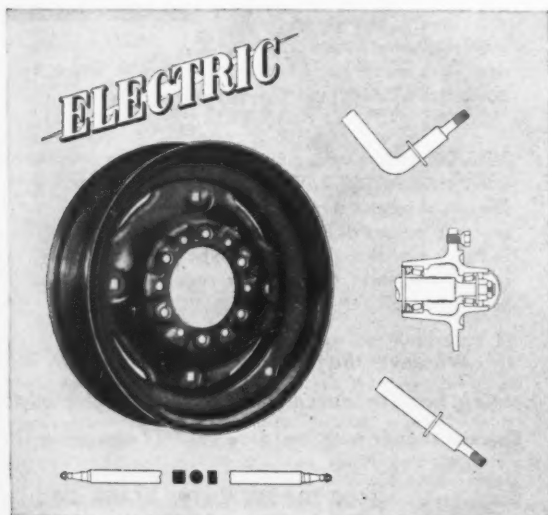


POWERS THERMOSTATIC WATER MIXER

Supply Fixture 4629PD, used above by AUTHENTICOLOR Laboratories, N.Y. City, thermostatically mixes hot and cold water and delivers the mixture at any constant temperature desired—regardless of pressure or temperature changes in water supply lines. Failure of cold water instantly and completely shuts off the delivery. Has 4" Easy to Read Dial Thermometer, stop check valves with removable strainers, vacuum breaker, 1/2" pipe connections, and is completely chrome plated. Capacity: 10 gals. per min. at 45 psi. Temperature Ranges 65-115° F.; 60-125° F.; and 75-175° F. Write for Bulletin 367.

Large Capacities up to 1000 gpm available in other types of controls. Write for Catalog WC.

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Our engineers will recommend the most efficient and economical wheel and axle assembly for your unit. We invite your inquiries.

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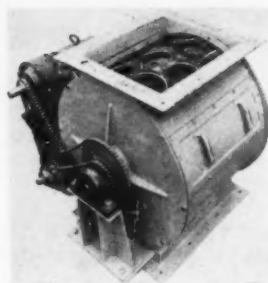
NEW EQUIPMENT . . . Begins on page 64

with a full 360 deg. swivel. A front wheel "equalizer" permits movement of axle to compensate for uneven floor surfaces and obstructions. This is an exclusive feature on all "Weld-Bilt" skid and pallet trucks. A safety spring keeps handle in vertical position so that it cannot drop to floor. *For specification sheets, circle key number on rip-out postcard.* Keville Industrial Service.

31

Pocket feeder handles unmanageable products

Here is a new rotary feeder claimed to successfully handle exceptionally sticky or flushy materials. Class or materials includes non-corrosive chemicals, feeds, grains, cement, food products, etc. In operation, a rotary pocket feeder traps a volume of material and carries it to a discharge. Machine has pockets that change volume, a great advantage when it comes to handling products that tend to aerate or stick. *For more information on this feeder, circle key number on rip-out postcard.* Richardson Scale Co.



32

New automatic weighing system eliminates overages and underages . . .

. . . Based on an advanced-type of instrumentation, system is said to permit finer process control than has been possible in weighing and filling operations. It is particularly suitable for handling any liquid or solid product in any operation where good quality control is desirable. *For complete information and literature, circle key number on rip-out postcard.* Richardson Scale Co.

33

Packaged brazing rings cut production costs

Speedier use in production, elimination of damage and loss, and constant accurate inventory are all said to be benefits of this new method of packaging pre-formed braz-

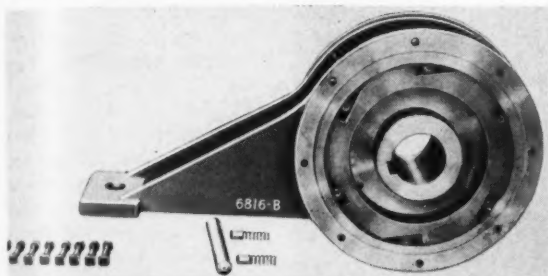
**SULPHURIC ACID
for the west
66° BAUME 20%
98% OLEUM
and special grades**

Garfield ESTABLISHED 1916
CHEMICAL & MFG. CORP.
700 PACIFIC NAT'L BLDG.
SALT LAKE CITY, UTAH

ing rings on cardboard tubes or on dowel rods. Firm manufactures a complete line of commercial silver alloys, copper and soft solder. *For your catalog of Alloy brazing and supplies, circle key number on rip-out postcard.* Alloy Ring Service, Inc.

34

S-A Enclosed Roller Type Hold-Back . . .



. . . prevents reversal of bucket elevators and inclined conveyors due to power failure under load. It consists of an inner member with wedge pockets for six hardened rollers which rotates with shaft. When shaft attempts to reverse, rollers wedge against an outer cylinder. Pressure springs and plungers guarantee instant engagement of rollers. Bulletin 444X gives complete information and specification data. *For your copy, circle key number on rip-out postcard.* Stephens-Adamson Manufacturing Co.

35

Grinding wheels for rough stuff

Carboflex depressed center grinding wheels are made for rough grinding, weld removal, cut-off and slotting operations for ferrous and nonferrous metals and non-metallics. Combining aggressive cutting action with extreme high strength and resistance to cracking, these new glass-fiber-reinforced resin bond wheels are said to provide efficient operation with maximum safety. Wheel's knurled face and back design enable operator to cut with both sides and periphery of wheel with no initial dressing. *For additional information, circle key number on rip-out postcard.* The Carborundum Co.

36

New hogshead attachment for lift trucks



Designed primarily to speed handling of hogsheads, Mercury's new unit can be installed in place of standard forks in a matter of minutes. Clamp is claimed capable of picking up hogsheads resting horizontally on a floor, without necessity of blocking and without special forward tilt range. Continuous and positive clamping action is maintained through use of a special hydraulic system which includes a locking valve in clamping cylinder and a pressure switch in pump motor circuit. *For specifications and more details, circle key number on rip-out postcard.* Mercury Manufacturing Co.

HOFFMAN Equipment Filters 32 Million Gallons of Coolant Every Working Day!



FOR GROUPS OF MACHINES

Hoffman Filtration Units automatically clarify soluble oil coolant in a continuous operation. Eliminates sump cleaning and assures grit-free coolant. Models from 20 g.p.m. to 1,500 g.p.m. flow rates.

Every eight hour shift over ten million gallons of coolants, cutting oil and solvent are reprocessed through Hoffman Filtration Equipment — 32,000,000 gallons every day, in every kind of plant, in every corner of the country to make America's industrial machinery more efficient and productive.

Clean coolant means less frequent dressing for grinding wheels. Grinder down-time is reduced and production rate increased. Grit-free cutting oil means an improved product finish and less wear on costly cutting tools.

Write for factual case studies that show how you can cut operating costs with Hoffman Filtration Equipment.

Ten basic types, as well as many special models, of Hoffman Filtration Equipment are available to solve your filtration problem.

Hoffman engineers will assist with recommendations, surveys and the design of the equipment for your particular filtration need.

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Shhh . . . you have to get up close to hear a CLEVELAND air cushioned vibrator. It's ideal on most hoppers, bins, chutes close to employees. Stops arching, bridging, sticking of granulars.



Our vibrating equipment . . . air-cushioned, quiet and standard metallic impact types . . . is available for immediate shipment from our San Francisco warehouse. Literature on request.

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CUSHIONED SHOCK**



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ABSORBS THERMAL EXPANSION
... PREVENTS BLOW-OUT**

WHEN SAFETY VALVES pop in this large industrial plant, a terrific surge of 900°F. steam blasts through the blow-off pipes under as much as 850 psi pressure. Ordinary pipe would blow apart. But Penflex Flexible Metallic Tubing has enough "give" to take the shock. Six lengths of 8" Penflex Interlocked tubing cushion the sudden impact . . . take up any pipe movement due to extreme temperature and pressure changes.

The Penflex Engineer can help you solve your tough tubing problems. A complete line of Penflex Flexible Metallic Tubing, Hose, and Couplings is at your disposal—4-wall interlocked and seamless welded corrugated tubing and metallic hose from 1/2" to 24" I.D. . . . automatic barrel fillers, pneumatic rivet passers, and fittings. Write for the new illustrated data book, "Flexineering."

Pennsylvania Flexible Metallic Tubing Company, Inc.

7201 Powers Lane, Phila. 42, Pa.

PENFLEX
HEART OF INDUSTRY'S LIFE LINES

NEW EQUIPMENT . . . Begins on page 64

37

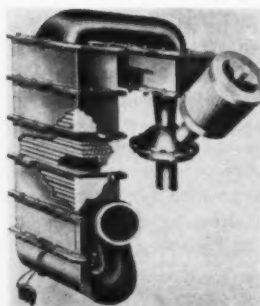
Heavy duty open end wrenches



Heavy duty open end wrenches, in a new line now available, are used with detachable tubular handles. Series consists of ten wrenches ranging in size from 7/8 to 1 1/2 in. Three different length handles, which fit two or more sizes of wrenches, are all that are needed to operate complete series. Wrenches are designed for heavy nut turning on jobs where box type wrenches cannot be used or are too slow and inconvenient. Circle key number on rip-out postcard for more complete information. Snap-on Tools Corp.

38

Eliminates exhaust fumes from lift trucks



OCM catalytic exhausts, when used to replace regular mufflers, are said to oxidize more than 95% of carbon monoxide and hydrocarbon content in truck exhausts. This results in safer, better working conditions. OCM catalytic exhausts are claimed usable on any engine, mobile or stationary, as long as non-leaded fuels are used. They can be adapted to LPG engines. They come as completely assembled units in standard sizes for most makes or sizes of fork lift trucks. For more complete information, circle key number on rip-out postcard. Oxy-Catalyst, Inc.

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Metal Turnings SHREDDERS

any capacity for your
Plant requirement

Reduce BULK
VOLUME of metal
turnings by 80%

Note: Low head space and
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hopper of small "Series
X Unit" shredder (shown)

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HELPFUL LITERATURE

39

Speeds lathe work— increases production

A special triple folder on Lathemaster will tell you what it is and what it does. Tool blocks and holders are pictured and described. A page of specifications and prices plus a clear diagram showing what to measure will help you in ordering your Lathemaster. A series of pictures show typical jobs illustrating versatility of this equipment. *Marvic Inc.*

40

There's a Tiger Brand rope for every job . . .

. . . and *Columbia-Geneva Steel* has for you a handy selection index that provides full tabular information on this product. Kinds covered include ropes of 6x7, 6x19, 6x37 and 8x19 classifications. This device will easily fit into your coat pocket. 1059

41

For charting sheet metal

A new handy wall chart, contains a tabular listing of standard weight per sheet, weight per bundle without bands and number of sheets per bundle, for Bethlehem's hot-rolled or cold-rolled sheets, galvanized and Bethlehem galvanized flat steel sheets, and Bethlehem formed galvanized products for roofing and siding. Chart measures 18½ x 31 in. *Bethlehem Pacific Coast Steel Corp.*

42

Concrete floors can last longer

Here is a folder telling how Durafax concrete floor hardener increases wear resistance and life of concrete floors. Close-ups, blow-ups and installation shots illustrate text. Durafax topping and monolithic methods are summarized. *A. C. Horn Co., Inc.*

43

Read up on slip fittings

This brochure tells how Nu-Rail slip-on fittings offer simplified installation application and structural strength. Application pictures and photographs of fittings round out the story. A page of valuable engineering data is included. *The Hollaender Manufacturing Co.*

44

"Principles of Heat Treatment"

Here is a well done 44-page booklet which tell you all about heat treating. Tables, diagrams, and on-the-spot photographs throughout add to readability of text. *Compton Foundry.* 40

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San Francisco 5, Calif.

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3. For complete information on **PRODUCTS ADVERTISED** in this issue, fill in page number and name of advertiser.

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41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
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WESTERN INDUSTRY

609 Mission Street
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45

Learn about Brainard scaffolding system

Folder shows application pictures including one of a tower which has been thrown together in 3 minutes. Final page is devoted to assembly instructions accompanied by photographs. *Sharon Steel Corp.*

46

Precision castings for the West

In this 3-color brochure Picco offers you volume production, convenient location, modern equipment and experienced engineering service. Some parts cast by company are presented with sketches and descriptive material. *Picco Inc.*

47

Buying guide to Clearfield mixers

This spiral bound volume leads off with detailed information on preparation of foundry sands and how a Clearfield mixer works, followed by a section on applications. Specifications and technical information accompany pictures of these mixers. *Clearfield Machine Co.*

48

"New Departure Instrument Bearings"

Brochure includes bearing requirements of synchros and other motors, descriptive details, and dimensions. Photographs in full color illustrate highlights of instrument bearing manufacture. There is a section on American Ordnance Association bearing classification and fundamentals for torque testing. Specifications for New Departure automatic torque tester are included. *General Motors Corp. AIB*

49

Hard-facing manual

This 40-page, hole-punched brochure tells you, with text, charts, tables, diagrams and pictures, what metals can be hard-faced, how to select correct rod, which welding process to use, how to make deposit, properties of hard-faced alloys, and typical applications. Excellent material. *Union Carbide and Carbon Corp. F-7338C*

50

Economical material handling multiplies man power...

... And this 56-page, profusely illustrated brochure tells you how it can be done. Chapter headings include: Why Mechanical Material Handling?; Which System of Material Handling?; Your Handling Problem; How Industry Uses Louden; What Louden Mon-rail Saves. *The Louden Machinery Co.*

HELPFUL LITERATURE

for the plant operator who wants to keep informed

51 Folder on light-weight spur gear hoist

A new two-color bulletin, describing Coffing Challenger, includes a cutaway drawing indicating its simplicity of design and ease of servicing. Other hoist features, dimension drawings, and specifications for ½-, 1- and 2-ton models are also included. *Coffing Hoist Co. CH*

52 About a wet blasting machine

An illustrated bulletin describing Model 30 Liquamatte wet blasting machine presents complete general specifications with illustrations. *American Wheelabrator & Equipment Corp. 93*

53 Aluminum roofing and siding described

This 16-page booklet presents in detail, with comprehensive drawings, easy, efficient methods of applying Alcoa corrugated industrial roofing and siding. It tells about maintenance-free characteristics of aluminum as a building material, and shows details on construction of an insulated wall. *Aluminum Co. of America. 12C*

54 Kaiser Steel reference book

A new 340-page general catalog contains 117 pages of general technical information and reference tables, in addition to complete information on company's iron and steel products. Characteristics, specifications, and standard practices are presented for Kaiser's 16-product categories. *Kaiser Steel Corp.*

55 Special nails, rivets, screws

A 34-page, spiral-bound catalog from John Hassall, Inc., shows firm's special lines of nails, rivets and screws

complete with text, blown-up photographs, and tables. A table of decimal equivalents is included. Firm encourages special orders. *John Hassall, Inc. 60*

56 "Eriez magnetic attractions"

Volume 7, No. 3 of this booklet, presents four new magnetic products that may be of real interest to you. They are: a new sheet fanner magnet; recovery magnet tool; rotary magnetic sweeperette; and a 4-in. diameter pulley which is added to firm's improved pulley line. *Eriez Manufacturing Co. 3547*

Circle key number on rip-out
card for literature you want

57 About architectural metal products

Here is a whole library of folders on Kawneer products. Material includes information on Zourite, aluminum roll-type awnings, W-Marquee and K-Louver. *The Kawneer Co.*

58 Intermountain industrial booklet

A 20-page booklet on Intermountain area industrial possibilities is now available. *Salt Lake City Chamber of Commerce.*

59 The Cadweld Process

Here, under one cover, is a collection of specification sheets on Caddy arc welding accessories. Application pictures, technical data and diagrams are accompanied by lists of prices and parts. *Erico Products, Inc.*

60 Latest development in speed control

A punched triple folder on Reeves Vari-Speed Motodrive with hydraulic control will tell you why it is needed, how it is applied and how it works. Photograph and diagrams add to clarity of the overall picture. A parts list is included. *Reeves Pulley Co.*

61 Specification sheet on 3-way Solenoid valve

Bulletin features 3-way steel and stainless steel valves. Information is presented on features, applications, operation and general descriptive material. Diagrams and flow charts help illustrate, and a table of list prices rounds out picture. *Automatic Switch Co. 8300*

62 Bay Region beckons to industry

Here is a progress report on San Francisco Bay region as a factory location. Industrial attractions and development results are gone into in detail. A section on trends includes national population, state population and Bay Area factory wage-earners. There are two maps of region—one with highway mileages. *San Francisco Chamber of Commerce.*

63 "Why you should have a Palmuth glass processing machine"

Features of this machine are presented accompanied by clear statement of terms under which one may be purchased. Equipment is photographically shown in various conditions. Specifications are given. *Safetee Products Co.*

64 Transformers

General specifications of Gardner transformers are accompanied by di-

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Dependable Rotary Pumps since 1927
939 East 95th St., Chicago 19, Ill.

Canadian Affiliate: Ingersoll Machine & Tool Co., Ltd.
Ingersoll, Ontario, Canada

HELPFUL LITERATURE

mensional sketches and a full page, detailed operational chart. Typical installations are pictured. Diagrammatic and tabular matter is given on Gardner transformers, subway type, 3-phase, and air-cooled. *Gardner Electric Manufacturing Co. 502*

65

**For conveying and treatment
of industrial products**

One hundred thirty-two spiral-bound pages are crammed with information on Cambridge conveyor belts. A sampling of material covered includes: engineering formulae and tables; flow sheets; and blueprints of typical layouts. Final section devoted to other Cambridge products with on-the-job photographs. *The Cambridge Wire Cloth Co.*

66

Water hose for every purpose

Illustrated bulletin contains photographs and cutaway sections of various hoses as well as tables of sizes, working pressures and weights. Hose constructions, lengths, couplings, and recommended applications are included. Water hoses for high, medium, and low pressure services are covered. *Quaker Rubber Corp.*

67

**Condensed info on
industrial trucks**

A new 4-page, two-color brochure covering electric-driven industrial trucks includes data on Automatic's new "Dynamotive." It illustrates and describes representative models of firm's riding-type and driver-led electric trucks, and presents information on fork truck attachment line. *Automatic Transportation Co.*

68

**On a pneumatic
thermometer controller**

This 10-page brochure on model 604P5 remote bulb thermometer controller presents diagrams, drawings, text and technical data in tabular form covering representative applications, control units and pilot relay, specifications, ranges, bulb styles, bushings and wells, and overall dimensions. *Minneapolis-Honeywell Regulator Co. 6401*

69

**Folder on "Nox-Sound"
Mastic coatings**

This 2-color pamphlet, well illustrated, explains just why and how Nox-Sound eliminates "tinniness"

**At
KAISER METAL PRODUCTS**



**C&D BATTERIES—
FOR EXTRA WORK!**

Last year, Kaiser Metal Products, Bristol, Pa., one of the country's leading producers of aircraft components, bathtubs, kitchen sinks and cabinets, used 50,000 tons of steel in turning out such products. To help handle the enormous quantities of parts and material required, Kaiser uses C&D Slyver-Clad* batteries to power many of the industrial trucks employed in its daily operation. For Kaiser, like hundreds of other major American companies, has found it pays to power with C&D Slyver-Clad batteries.

C&D Slyver-Clad batteries are approved as standard equipment by all electric truck manufacturers. For further information, write for catalogs.

*T.M. Reg.

C&D BATTERIES, INC.

of Conshohocken, Pa.

Manufacturers of Industrial Batteries since 1906

SALES AND SERVICE OFFICES

IN PRINCIPAL CITIES FROM COAST TO COAST

from a product and replaces it with a feel of solidity with one treatment. *Nox-Rust Chemical Corp.*

70

Carbide catalog

Twenty-four pages of 40 different high-quality carbide-tipped tools present complete information and specifications on: drills, reamers, masonry, glass and gun drills, shell reamers, lathe centers, countersinks, special tools and tool bits. Engineering information and a carbide grades chart is included. *Chicago Latrobe.*

Circle key number on rip-out card for literature you want

71

Johns-Manville products

A new edition of firm's 40-page catalog offers essential data on these product groups: insulations, refractory products, asbestos cement pipe, packings, gaskets, electrical products, frictional material, roofing, siding, flooring, partitions, and ceilings. Material is illustrated with photographs and diagrams. *Johns-Manville.*

72

Corrosive info

This 8-page folder contains information on comparative corrosion resistance of stainless steels to corrosive media. It presents pertinent data on six widely used stainless tubing steels and several hundred corrosive media at various temperatures and concentrations. *The Babcock & Wilcox Co.* 160

73

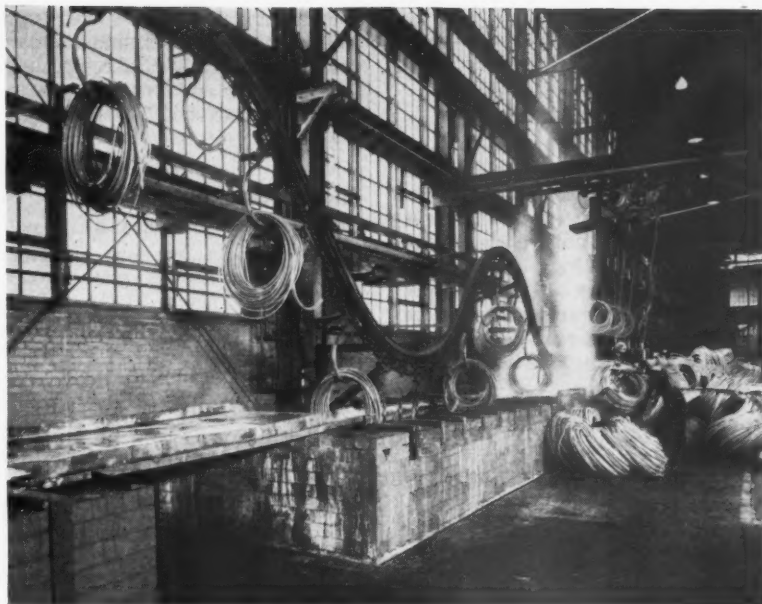
Signode is 40 years old

Twenty illustrated pages tell how growth of steel strapping industry parallels 40 year history of one of its manufacturers. Many "firsts" in this industry—in tools and methods—are shown, followed by pictorial presentations of today's most modern tools, equipment and methods. *Signode Steel Strapping Co.*

74

V-belt guide

Here is an 8-page brochure on new Veelos TD and TE adjustable V-belt for D and E belted drives. Newly designed studs, cup-washers and T-screws are illustrated in detail. Installation and operation characteristics include directions on: How to measure; how to couple and uncouple; and how to install. *Manheim Manufacturing & Belting Co.*



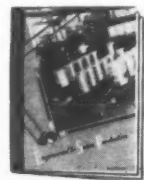
OVERHEAD TROLLEY CONVEYERS

one of the many types of high-quality power and gravity conveyers in the MATHEWS Line



Overhead Trolleys are among the most frequently applied types of power conveyers. They are used to serve processing machines, move material from one area to another, take components through painting, drying and enameling operations, and are, in fact, an extremely versatile type of equipment. Trolley Conveyers can be lowered, through the use of transverse bends, to working areas so that parts may be placed or removed from hooks or trays. They are used for storage conveyers, holding materials until needed and saving valuable floor space for production machines.

• Write for catalog HB53 for complete details of Trolley Conveyers and for other types of Power Conveyers and Special Conveying Machinery, or for Catalog No. 853, featuring numerous installations that might help you with your conveying problems. Both catalogs are yours for the asking.



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SEATTLE
SALT LAKE CITY

Engineering Offices and Sales Agencies in Principal Western Cities

HELPFUL LITERATURE

75

Bulletin on "Temperature Control Systems"

This educational bulletin includes section to help in selecting sensing elements and their correct use for most satisfactory results. Instrument industry control terminology is given plus rules to follow in selecting proper method of temperature control for process characteristics or reaction. *Barber-Colman Co.* F 6149

76

Booklet on stranded electrodes . . .

. . . discusses use of stranded wires in inert-gas-shielded metal-arc consumable electrode Aircomatic welding process. This 12-page article is a reprint from "The Welding Journal." *Air Reduction Pacific Co.*

77

Booklet on cast high alloys

This 8-page reprint of a technical article by E. A. Schoefer, executive vice president, A.C.I., discusses cast corrosion resistant alloys most generally used for process equipment in chemical industries. Tables of physical

and mechanical properties of cast corrosion resistant alloys, and standard designations and chemical composition ranges for heat and corrosion resistant castings are included. *The Cooper Alloy Foundry Co.*

78

Single point carbide tools for all applications

New 12-page brochure describes and illustrates a wide variety of carbide tipped single point cutting tools. Data on producing chip-control grooves on cutting surface of carbide tools is shown on back page. *The DoAll Co.*

Circle key number on rip-out card for literature you want

79

Brochure on ERW electric resistance weld pipe

Kaiser Steel stands up to its own tradition in putting out a brochure outstanding in its combination of information and eye-appeal. This 16-page, two-color job takes you through

process of making a length of pipe from leveling skelp to loading finished product. Story is told in picture-caption style. A dimension-weight table in back of book will be of particular value to engineers. Information is given on outside diameter, wall thickness, lb. per ft., and net tons per 100 ft. and per one mile. 187

80

"A Steel Fabricating Service Designed to Your Requirements"

McDonough Steel Co. says, "Call McDonough the next time your firm is in need of steel fabricating work." Firm's brochure illustrates, with on-the-spot pictures, some of its installations. Company is equipped to fabricate steel plate to meet all types of code work specifications.

81

Folder on interchangeable tapered bushings and sprockets

Pictures and diagrams illustrate features of Shold-A-Grip interchangeable tapered bushings and sprockets. There is a bushing and sprocket selection chart, with directions on how to use it, and a specification chart with catalog numbers of Shold-A-Grip bushings available from stock. *Boston Gear Works.*



ANNOUNCEMENT

In the fall of 1952, W. C. Dillon & Co., Inc., moved its entire production facilities and executive offices to Van Nuys, California, where we have erected a new, completely modern factory. Visitors are cordially invited to inspect our new plant where we maintain a fully equipped showroom, demonstrating our entire line of precision, low cost testing and weighing instruments and stainless steel thermometers. If you have not already done so, we would appreciate it if you would please alter your records to show our address as given below. Thank you!

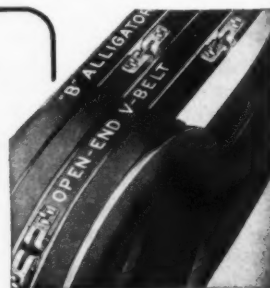
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**WHICH
V-BELT**
is best
for you?



ALLIGATOR V-BELT FASTENERS

★ In this way you can make up V-Belts in *any length* to fit *any drive* the fast economical way—V-Belts that perform exceptionally well.

If the correct size of endless V-Belt is not readily available, or if you have to tear down machinery to install, then the best belt to use is open-end V-Belting fastened with

★ In contrast to link-type belts these ALLIGATOR fastened V-Belts have just *one strong joint . . . stretch and follow-up maintenance are reduced to a minimum.*

ALLIGATOR INTRODUCTORY V-BELT DRIVE UNITS

contain V-Belting, Fasteners and Tools—everything you need in one compact package to make up V-Belts quickly. Available in sizes A, B, C & D.

Ask for Bulletin V-215 and V-216
Order From Your Distributor

FLEXIBLE STEEL LACING COMPANY
4642 Lexington Street, Chicago 44, Illinois



82
Introducing "ST" series Liquid-Tight conduit connectors

An attractive three-folded sheet features *Appleton Electric Co.*'s high quality Liquid-Tight connector designed specifically for use with Underwriters' approved Liquid-Tight flexible conduit. Specifications and photographs will be an aid to ordering. *Appleton Electric Co.*

83
"Tydol HD Oils for every purpose"

A comprehensive booklet from *Tide Water Associated Oil Co.* tells you first just what Tydol HD Oils are. Publication explains why they are needed, how they work, and then some of their characteristics including how they clean as they protect as they lubricate. Illustrative pictures accompany text. A chart presents recommended application, and final page tells just what Tydol HD Oils will do for your engine.

84
All about vapor degreasing equipment

Three types of Currier degreasers are offered, Drum Major, Standard, and Special. This brochure goes into

great detail on each type with specifications, diagrams, and photographs. Some case histories with actual installation photos round off this picture. In addition to standard degreasers, firm makes special ones to solve special problems. *Currier Co.*

85
"New Ideas in Wire Rope Slings"

This is a new folder, from *H. K. Porter Co., Inc.*, fully describing Red-Strand line of multiple part slings and Pin-Lock thimbles. Folder explains how these thimbles reduce sling costs by an average of 20%. It describes single-part slings with single-swaged fittings, in addition to Red-Strand Grommet slings.

86
Bulletin describes bellows

A six-page brochure, issued by *Titeflex, Inc.*, describes company's special type of metal expansion bellows for conveying gas and liquids. Text and diagrams explain welded-diaphragm construction and point out how this results in a bellows especially able to withstand high temperature, vibration, and corrosion. A table of standard sizes is shown, and a specification sheet listing engineering information required for ordering is included. 300

87
Folder on tubing and pipe for high-temp. service

A new data folder from *The Babcock & Wilcox Co.* presents condensed technical data on 14 tubing steels used in high temperature or high pressure service. Data on analyses, mechanical and physical properties, creep strength, short-time elevated temperature tensile properties, oxidation resistance, is given on tubing steels from plain low-carbon to 25% chromium-20% nickel stainless. TDC 163

88
Lubrication with a flick of a switch

How to automatically lubricate entire conveyor lines—trolley wheels, chains, drives, carriers and rollers—without line stoppage, is illustrated in a new fact sheet from *Stewart-Warner Corp.* Drawings, pictures, text, and specifications, tell Stewart-Warner's story.

89
"Transite Ducts" . . .

. . . is a new 12-page brochure issued by *Johns-Manville*. It covers installation and maintenance information on Transite Conduit (for exposed work

**Wondering who
that wholesaler is?**




The answer's in the YELLOW PAGES!



Any time you want to know who handles the products you need—the handy Yellow Pages are at your service. In convenient "Classified" listings you'll find names, addresses and phone numbers of wholesalers, manufacturers, and suppliers. In fact, for any product or service you need—it pays to look in the Yellow Pages.

You'll find it fast in the YELLOW PAGES!

 **Pacific Telephone**



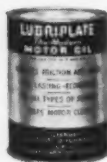
**"THIS LUBRICANT
EXTENDED
BEARING LIFE
50%"**

—says REPUBLIC AVIATION CORP.
Makers of the famous F-84E THUNDERJET

"Under actual tests, LUBRIPLATE extended bearing life fifty per cent or better as compared to other lubricants. It was also found that, during test, LUBRIPLATE increased efficiency of machines twenty per cent by reducing friction loss. Republic has been using LUBRIPLATE successfully for the past eight years."

**REGARDLESS OF THE SIZE AND
TYPE OF YOUR MACHINERY,
LUBRIPLATE GREASE AND
FLUID TYPE LUBRICANTS WILL
IMPROVE ITS OPERATION AND
REDUCE MAINTENANCE COSTS.**

LUBRIPLATE is available in grease and fluid densities for every purpose... LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.



For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.



HELPFUL LITERATURE

and installation underground without concrete encasement) and Transite Korduct (for installation in concrete). Fully illustrated, booklet cites typical examples from public utilities, telephone companies and other industries which show how these materials can cut cable subway costs. EL-29A 7-53

90

Case study report on space heaters

Case Study No. 560-56, issued by Dravo Corp., describes how a metal fabricating shop saved two-thirds cost of a conventional heating system by using oil-fired, warm-air space heaters. This folder tells reason behind this saving, economics of operation, and amount of floor space recovered for manufacturing after an old, complicated system was replaced.

91

Head and hand protection

Here is a folder on Fiberglas welding helmets and handshields featuring light weight, strength, proof against moisture, warping and heat, and easy sterilization. Final page presents fresh

**WE CARRY
JUST ABOUT**

Everything

**IN
WIRE**



WIRE CLOTH
AND SCREEN
WIRE PRODUCTS
WIRE STRAIGHTENED
AND CUT
WIRE OF ALL TYPES

IMMEDIATE DELIVERY

**INDUSTRIAL Wire
PRODUCTS**

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SAN ANTONIO 12, TEXAS
4868 PINE ST. • HO 9-3753
LA MESA, CALIFORNIA

air supplied welding helmets, and replaceable leather sweatbands. Metal & Thermit Corp.

92

"How to" booklet on capacitors

Contents include how to use capacitors to reduce power costs, and to gain system capacity, how high to raise power factor, how many capacitors to use, and where capacitors should be applied. It tells how to switch capacitors with load and separately. Detailed tables of technical data are included plus pictures, graphs and diagrams. General Electric.

93

What Rucker can do

Here is a folder of typical hydraulic and pneumatic applications by the Rucker organization. You are invited to put Rucker's experience with hydraulic and pneumatic systems to work on your power transmission and process control problems now. The Rucker Co.

94

Electric vibrating feeders and conveyors . . .

. . . are thoroughly covered in this 85-page, two-color publication. General specifications and dimensions are accompanied by photographs and charts of size, dimensions, power and weight. Miscellaneous equipment comes at end of book plus two pages devoted to "useful information." The Jeffrey Manufacturing Co. 830

95

Lift truck guide for you

A new 8-page illustrated booklet on 4,000-lb. capacity Hyster YT-40 lift truck gives complete description, specifications and actual on-the-job photos. Mechanical description and capacity charts included. Hyster Co. 1284

96

Buying guide to conveyors

A new, 16-page, two-color illustrated catalog of Rapistan conveying equipment is now available. Catalog has photos, specifications, and application suggestions on firm's complete line of belt units, gravity wheel and roller conveyors, casters and hand trucks. The Rapids-Standard Co., Inc. GC-53

97

On Flexon flexible metal hose

A 32-page, illustrated brochure covers full range of Flexon metal hose; Rex-Weld corrugated metal hose; Rex-Tube convoluted hose types; Rex-Flex stainless steel flexible metal and heavy duty stainless steel hose;

and numerous special purpose assemblies. Specification tables and photographs appear throughout. *Flexonics Corp.* 130R

98 The A B C's of Pritchard Hydriers

This brochure tells you what a Hydrier is and what it will do for you. General information on this equipment is included, and Type A Hydrier is concentrated upon. Types B, C, D, and H are pictured and described. *J. F. Pritchard and Co.* 16.0.081

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card for literature you want

99 Industrial insulations of Fiberglas

Mathematical minds should have a field day with this 16-page booklet from *Owens-Corning Fiberglas Corp.* To start off, there is a selective index to Fiberglas industrial insulation. Then comes a table on available sizes, thicknesses and forms of PF pipe insulation and dual temperature pipe

insulation. Tables following include: heat losses—bare and insulated pipes; recommended thicknesses of Kaylo pipe insulation; standard sizes and insulation efficiencies. *IN6.C2*

100 "Chemicals derived from Tin, Antimony, Zirconium"

A comprehensive collection of tables covers these chemicals: inorganic tin; organic tin; antimony, and zirconium, in these categories: product, formula, description, uses, and packaging. There follows a list of more metals and alloys produced by *Metal & Thermit Corp.*

101 "Confab"

This issue of *Acme Steel's* quarterly publication includes illustrated descriptions of latest cost-saving application of steel strapping and wire stitching. A new accurate method of wire stitching is also explained. *Acme Steel Co.*

102 "Protection With Parlon"

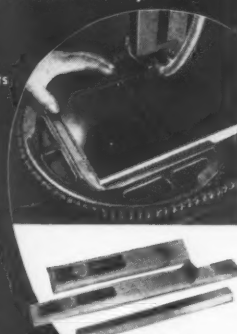
Thirty-five case histories of successful use of protective coatings based on chlorinated rubber are in this new 20-page booklet. Included is performance data and instructions for applying

DoALL Precision Tool and Die Steel

(Ground Flat Stock)

Save time, labor, money

- Ready to use for tools, dies, gages, parts
- Parallel, square, precision ground
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Consult your yellow Directory for location of nearest of the thirty-eight DoALL Sales-Service Stores that stock complete metal working necessities.

Ink it!
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Machine Tools Cutting Tools Measuring Instruments
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NOW 3 Convenient West Coast Service Centers for Dependable Dick POWER TRANSMISSION AND CONVEYING EQUIPMENT

To give you faster service, R & J Dick Co. now maintains three West Coast offices and warehouses—at Los Angeles, San Francisco and Seattle.

Each center is ready with the complete line of dependable Dick power transmission and conveying equipment . . . accepted by man-

BARRY STEEL SPLIT PULLEYS



Scientifically designed. Electrically welded. Light weight. Easily installed. Maintain exact shape under all loads.

DICK ROPE QD SHEAVES

Heavy duty "quick-demountable." On or off shaft in minutes. No wobble or loss of balance. 802 stock sizes fit over 25,000 stock drive combinations from 1/2 to 600 hp. Also . . . stock V-Belt drives and "special" sheaves for every application.



ufacturers who rely on the Dick line to help them avoid costly breakdowns and repairs. For information on how you can step up the efficiency of your production, call or write the office nearest you.

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DICK'S BALATA BELTING



Hard surface, closely woven duck, thoroughly impregnated with Balata Gum. Free from stretch and shrinkage. Moisture resistant. High transmission efficiency.

BARRY CONVEYOR PULLEYS

Light weight combined with super strength. Welded steel construction. Easily installed. Wide range of sizes for all general conveyor services.



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SUtter 1-1341

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MUtual 1922







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BAR STOCK—
4 TYPES, 99 SIZES—
IN STOCK!

Save time and money... Order from stock!

COMPTON FOUNDRY now maintains stocks of type GA Meehanite castings in square, rectangular, solid-round, and cored-round bars — 99 sizes in all! And we've made it easy, fast and economical to buy Meehanite bar stock *when you want it*. Your truck can pick up your order the same day you phone. You save money, too, by ordering from stock, because *we* provide the patterns.

Check these bar types and sizes:

-  **SQUARE, 12" long**
12 sizes, 1" x 1" to 4½" x 4½"
-  **RECTANGULAR, 18" long**
40 sizes, 1" x 1½" to 4½" x 10"
-  **SOLID-ROUND, 16" long**
23 sizes, 1" to 12" diameters
-  **CORED-ROUND, 16" long**
24 sizes, 3½" O.D. x 1" I.D. to 9" O.D. x 5½" I.D.

Order MEEHANITE® Bar Stock FROM STOCK!

Call COMPTON FOUNDRY TODAY!

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FREE STOCK CARD. Write for valuable stock card showing complete list of bar sizes and weights of type GA Meehanite Metal. No obligation, of course. Write Dept. 53.



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OF
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METAL

COMPTON FOUNDRY
 1320 S. Alameda Street - Compton, Calif.

HELPFUL LITERATURE

Parlon paints by brush or spray to metal, wood, cement and asphalt surfaces. *Hercules Powder Co.*

103

Rust-Oleum 20-page general guide

New 1954 catalog features 94 color chips of Rust-Oleum stop-rust paint products and includes complete instructions for surface preparation and application of firm's primers, short and long oil type, machinery and implement finishes, chemical and heat resistant types, sealers, oil field finishes, thinning oils and floor and masonry coatings. *Rust-Oleum Corp.* 253

104

Resin Resumé

Here's a summary sheet reviewing five coating and impregnating varnishes, an adhesive, and six bonding and laminating resins. Comparison tables show each resin through nine properties. Included are curves showing thermal life of leading silicone dipping varnishes and cloth coating resins, plus that of Class B materials. *Dow Corning Corp.* 10-227

105

Materials handling aid

A new 3-color, 12-page catalog shows, in addition to a new combined tractor-trailer and towline order picking system for warehouses, 50 different models of floor trucks, 12 types of dollies and 16 styles of casters. Complete specifications given for standard sizes available on each item. *Nutting Truck and Caster Co.* 54G

Circle key number on rip-out card for literature you want

106

"Caterpillar Diesel D6 Tractor"...

... is a new 32-page booklet, with photos and model cutaways of D6 track-type tractor's basic components, describing what goes into making up each component. Brochure is highlighted by a double-page detailed cutaway of this tractor. A specification sheet and list of attachments are included. *Caterpillar Tractor Company.* 30379

When Performance Counts...



The third installation for General Pipe Corp., Los Angeles

In heavy industry, where production lines depend on continuous performance of overhead cranes, those who know select Craneveyor. Time and time again, like the installation shown above, Craneveyor has been selected on past performance. Craneveyor has the facilities to meet all of your crane and hoist requirements. They have the experience and engineering skill to design the type of job that will fit your specific needs. A telephone call or a letter will bring our representative to your office.

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IS SELECTED
AGAIN AND AGAIN



CRANEVEYOR CORP.

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HARDBOARD in Pacific Northwest

Summary of Pacific Northwest
hardboard plants, processes
and capacities*

OPERATING COMPANIES

Plant and process	Annual capacity (million sq. ft.)	Tons of dry wood required per day (250 days/yr.)
Chapman Mfg. Co., Corvallis, Ore. Wet-batch	24	38
Forest Fiber Products Co., Forest Grove, Ore. Wet-continuous	62	98
Oregon Lumber Co., Deer, Ore. Wet-continuous (with bark)	56	88
Anacortes Veneer Co., Anacortes, Wash. Semi-dry	30	45
Coos Bay Lumber Co., Coos Bay, Ore. Semi-dry	70	105
Cascades Plywood Co., Lebanon, Ore. Dry	36	54
Long-Bell Lumber Co., Longview, Wash. Dry	15 (1/4 in.)	37
Weyerhaeuser Timber Co., Klamath Falls, Ore. Dry	90	134
Total 1953 capacity	407	662

UNDER CONSTRUCTION

Oregon Fiber Products, Inc., Pilot Rock, Ore. Wet-dry	80	126
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PROJECTED

Rogue Hardboard, Inc., Grants Pass, Ore.	—	—
Washington Hardboard Products, Inc., South Bend, Wash.	—	—
Willamette Fibre Board, Inc., Sweet Home, Ore.	—	—

*Plant capacities are taken from a table appearing in the 1953 Review Number of The Lumberman, Vol. 80, No. 4, page 132, March 1953.

(a) Square footage is based on 1/8-in. board unless otherwise stated.

(b) Conversion factors used are:

1/8-in. board—725 lb. per M sq. ft.

1/4-in. board—1,200 lb. per M sq. ft.

Wet process—92% yield of dry weight of wood.

Dry or semi-dry process—97% yield of dry weight of wood.

SCIENTIFIC SET-UP

TRUESDAIL Laboratories, Inc., Los Angeles, has established a research advisory board of internationally-known scientists to help guide procedures and evaluate results of projects under way for the firm's clients. Appointees are: A. J. Haagen-Smit and D. M. Yost, Cal. Tech., Pasadena; C. H. Thienes, Huntington Memorial Hospital, Pasadena; A. W. Adamson, U. S. C., Los Angeles; and W. G. Young, U. C. L. A.

ELECTRONIC nutcracker boosts production

THE WORLD'S FIRST electronic nutcracker, described in the May issue of WESTERN INDUSTRY, is setting new production records in the processing plant of the Northwest Nut Growers in Portland.

As the walnut tumbles off the threaded feeder roll, it is positioned and grasped in mid-air between its stem and blossom end by two metal electrodes. The 65,000-v. jolt pierces the shell through the electrodes, and the shell and meat drop onto a vibrator conveyor which separates the two.

The nutcracker automatically shells 1,200 lb. of walnuts an hour, as compared to 900 lb. produced on the crusher type nutcracker. A far higher percentage of nut halves is also produced by the new method. A cracking crew of 60 now handles the same volume of nuts as the former crew of 100.

Eventually, officials hope to triple the walnut shelling rate to 60 nuts a second and possibly even extend the electronic nutcracking process to filberts, since 98% of the U. S. crop is raised in Oregon's Willamette Valley and western Washington.

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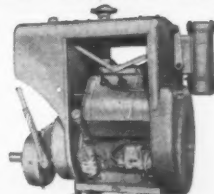
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While "snow removal" may have no relationship to your problem, this equipment nevertheless typifies the adaptability and versatility of Wisconsin Heavy-Duty Air-Cooled Engines to a great variety of applications. There is a size to Fit the Machine and the Job, in a complete power range from 3 to 36 hp., without power waste and with maximum Power Advantage. Specify "Wisconsin Power" for your equipment.



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Clutch Reduction.



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87

WESTERNERS AT WORK

ARIZONA

Navajo Tribe

Grover Elmore, Tucson, is named business manager of tribe's 22 enterprises, Window Rock.

CALIFORNIA

Rezolin, Inc.

This Los Angeles firm names N. W. Hastings as head of its Product Development division. He has been chief chemist for company.

American Potash & Chemical Corp.

Calvin L. Dickinson joins corporation as advisory engineer, Trona plant. He was formerly

merly plant manager, organic chemicals division, Diamond Alkali Co., Houston. Frank A. Jessup, previously with Pacific Indemnity Co., is named safety engineer at Trona.

Roylyn Inc.

B. J. Angell is named to post of production control manager. He joined this Glendale firm's planning department in August. He was previously associated with Hydro-Aire.

California Ink Co., Inc.

William H. Brandes is elected president of this San Francisco firm. R. H. Wellington, secretary-treasurer, is now in charge of administration. He takes over from A. N. Nathan, resigned.

Southwestern Engineering Co.

Tom Lyon, until recently director of Domestic Expansion division of Defense Materials Procurement Agency, joins firm at Los Angeles as consulting engineer.

T. A. White Candy Co.

Paul Menconi is named superintendent of this San Francisco firm. He was formerly superintendent of Sierra Candy Co.

Lycy Machine Works

Asa Farrell, formerly superintendent of company in Oakland, is promoted to position of works manager. He was previously with Production Engineering Co. in Berkeley.



A. Farrell
Lycy Machine
Works



H. C. Millerburg
Loven Chemical
of Calif.

Loven Chemical of California, Inc.

Harry C. Millerburg, former executive vice president, is elected president of this Newhall, Calif., firm. He succeeds Dr. Karl A. Loven, deceased.

San Diego Gas & Electric Co.

L. M. Klauber retires from his position of executive officer. He is replaced by E. D. Sherwin, president of the concern.

Crown Zellerbach Corp.

Ivan E. Nicoll transfers from Carthage, N. Y., plant to become resident manager-production of Los Angeles area paper converting plants. Newbey A. Green is appointed resident manager-sales for Southern California territory. His headquarters will be in Los Angeles. Arthur Hauschild is named superintendent, Western Waxed Paper division, San Leandro, succeeding V. Hunter, resigned. He is replaced as superintendent of firm's Los Angeles plant by Clayton Hayes.

Southern Counties Gas Co.

Guy W. Wadsworth, Jr., a company vice president, is named general manager of this Los Angeles concern. He takes over managerial duties from Arthur F. Bridge, who will continue to serve as president.

Gordon I. Gould and Co.

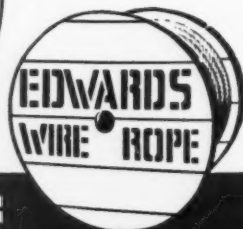
Gordon I. Gould resigns as president of New Idria Mining and Chemical Cos. of

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Exclusive Distributor for the Nox Rust Chemical Corp. Sales offices and warehouses: 725 Second St., San Francisco 7, DO 2-6511, and 1855 Industrial St., Los Angeles 21, VA 4954. Distributors: United Chemical Co., Inc., Portland; Carl F. Miller & Co., Seattle; Spokane; Scotch-Irish Co., Salt Lake City.

California and Honduras. He will give full attention to consulting mining engineering work for Gordon I. Gould and Co., San Francisco.

Drayer-Hanson, Inc.

Joseph Abdo, formerly supervisor of this Los Angeles firm's automatic controls division, is named chief engineer of all divisions.

Shell Oil Co.

G. C. Montgomery is appointed superintendent of concern's refinery at Wilmington. He is promoted from position of assistant superintendent-administrative.

Remler Co., Ltd.

Leslie B. Tollaksen is appointed manager of technical products for this electronics manufacturing firm, San Francisco. He was recently with Philco Corp.

California & Hawaiian Sugar Refining Corp.

H. T. Woodward, formerly chief engineer at Crockett refinery, is appointed plant manager, succeeding A. L. Holven, deceased. T. R. Gillett becomes assistant plant manager. He is replaced as chief chemist by P. D. Meads, formerly assistant chief chemist.

William Miller Instruments, Inc.

Concern at Pasadena makes following appointments: vice president and chief engineer, George W. Downs; vice president and treasurer, Edwin M. Graham; secretary, Charles T. Munger; production manager, Paul Ashway.

Golden Citrus Juices, Inc.

Phill Twombly is now plant manager of operation at Fullerton. He succeeds Dr. J. L. Held.

United States Steel Corp.

Loren J. Westhaver, formerly vice president and manager of concern's operations in Utah, is appointed general manager of operations for Columbia-Genva Steel division with headquarters in San Francisco. J. D. McCall is named assistant general manager. He is succeeded as general superintendent at Pittsburgh by Donald E. Rice who formerly held that position at Torrance. R. B. Freeman, formerly assistant to general superintendent at Pittsburgh works, becomes assistant general superintendent. C. C. Morgan, formerly assistant general superintendent, is named general superintendent, Torrance works.



J. D. McCall
U. S. Steel
Corp.

A. E. Werolin
Nat'l. Motor
Bearing Co., Inc.

National Motor Bearing Co., Inc.

A. E. Werolin, formerly vice president in charge of administration and planning and previously vice president and Pacific Coast manager for McKinsey & Company, is appointed to post of vice president and general manager of company at Redwood City.

United States Vanadium Co.

H. L. McKinley is named general manager of this division of Union Carbide and

Carbon Corp. He has been a metallurgist and general superintendent for concern. He will headquarter at Pine Creek mine near Bishop.

Gladding, McBean & Co.

Firm at Los Angeles elects Paul J. Lovewell to position of vice president and appoints him a member of its management committee. He will continue to serve as manager of company's Northern California operations.

Meletron Corp.

This Hollywood maker of automatic pressure controls promotes James B. Humphrey to position of chief engineer. He is replaced as chief applications engineer by Jack S. Mott.

Southern Pacific Co.

Oscar A. Smith, president of Pacific Electric Railway, is named assistant to president, Southern Pacific Co. He will headquarter in Los Angeles.

Pabco Products, Inc.

Harry E. Kaiser is appointed technical director of this San Francisco floor covering and building material concern. Harry H. Surprise becomes general service manager. George M. Nummy is named plant manager of factory at Redwood City replacing B. A. Wilson who is now company's production supervisor of felt, roofing, and paint products.

James B. Lansing Sound, Inc.

Arnold Kalland is appointed assistant general manager of this Los Angeles firm. He was previously with Wells All-Steel Products

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In Exclusive
"Strip-Out"
METAL BOX

- "DEMON" HIGH SPEED STEEL
- PRECISION (For Metals)
- BUTRESS (For Wood and Metal)
- CLAW TOOTH (Nonferrous Metals)
- KNIFE (For Cloth, Paper, etc.)
- SCALLOP EDGE (Fabrics)
- SPIRAL (360° Curving for Wood, Plastics)
- DIAMOND EDGE (Glass, Ceramics, etc.)
- LINE GRIND (For Hardened Alloys)
- FRICITION, BUTCHER, SKIP TOOTH, etc.

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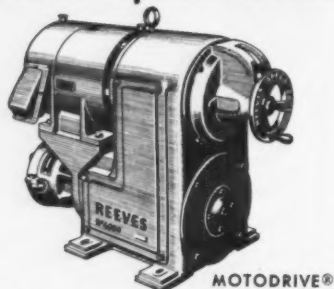
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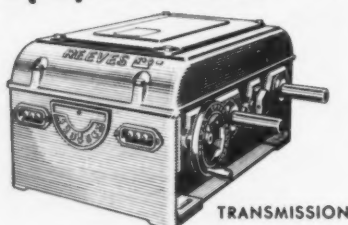
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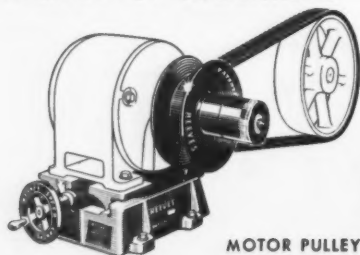
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WESTERNERS AT WORK

Co., North Hollywood, as purchasing agent
and assistant office manager.

Cinema Engineering Co.

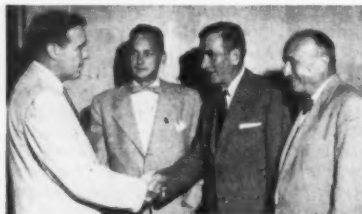
Vic Lees, formerly production manager of
Cole Instrument Co., Los Angeles, joins
Cinema Engineering Co. division, Aerovox
Corp., Burbank, in similar capacity.

Bethlehem Pacific Coast Steel Corp.

E. H. Jones, formerly chief hull drafts-
man, is appointed naval architect. His former
assistant, *C. M. Garland, Jr.*, takes over as
chief hull draftsman. Both will maintain their
offices at company's San Francisco shipyard.

COLORADO

Denver Research Institute



Shirley A. Johnson, Jr., (left) director of
Denver Research Institute, University of
Denver, greets three new members of ad-
visory panel. Center to right are *C. Neil
Norgren*, vice president of C. A. Norgren
Co.; *B. C. Essig*, vice president of Gardner-
Denver Co.; and *M. Grimes*, president of
Morse Brothers Machinery Co.



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Ideal Cement Co.

Former Portland Plant Manager *S. A.
Gretencort* is promoted to position of central
division superintendent. He replaces *Claude
Rodarmel*, retired. *George Koonsman*, for-
mer Boettcher plant engineer is named as-
sistant plant manager at Devil's Slide, Utah.
He replaces *Horace Straight*, recently ad-
vanced to plant managership there. *S. D.
Sajkowsky*, former plant manager at Gold
Hill, Ore. is appointed plant manager at
Redwood City, Calif. He succeeds *E. F. Bol-
linger* who is transferred to Baton Rouge,
La. as plant manager there. *Frank Sutcliffe*,
who was supervisor of concern's California
and Oregon coast railroad at Gold Hill, is
promoted to position of plant manager there.

Colorado Interstate Gas Co.

W. E. Mueller is elected president at Colo-
rado Springs to succeed *Robert W. Hendee*,
resigned. Before joining Colorado Interstate,
Mr. Mueller was with Tennessee Gas Trans-
mission Co. of Houston. Mr. Hendee will
serve as consultant to company management.

IDAHO

Simplot Co.

G. R. Inkpen is named production super-
intendent of concern's fertilizer plant at
Pocatello. He comes from Consolidated
Mining & Smelting Co., Trail, B. C.

NEW MEXICO

Atomic Energy Commission

C. L. Tyler, manager of AEC's Santa Fe
operations office, Albuquerque, retires. He
is succeeded by *Donald J. Leehy* formerly
of Harrison, N. Y. where he was president,
Envelopener Corp.

Kennecott Copper Corp.

W. Howard Winn is named superintendent
of Hurley smelter, Chino Mines division,
to replace *E. A. Slover*, who becomes as-
sistant general manager of Chino Mines di-
vision. *Wesley Dow* is appointed assistant
smelter superintendent.

OREGON

Smith Canning & Freezing Co.

Milan D. Smith becomes president of this
Pendleton concern and also of Smith Frozen
Foods of Oregon, Milton-Freewater, Ore. He
succeeds *Albert T. Smith* who now is chair-
man of board.

MILLER-ROBINSON CO.

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Blue Lake Packers, Inc.

Norman W. Merrill, formerly executive vice president, is named head of this Salem organization to succeed founder, O. E. Snider, retired.

Weyerhaeuser Timber Co.

Hugh B. Campbell, formerly assistant branch manager, takes over as manager of concern's Klamath Falls operations. He succeeds R. R. Macartney, retired.

Production Management Engineering Associates

George C. Fleming, Sr., is appointed to staff of this management consulting firm. He will headquarter in Portland.

Robert Dollar Co.

Thomas H. Mehl, Jr., is elected vice president in charge of mill and logging operations, Glendale. He has been logging division superintendent at Glendale.

UTAH

Western Phosphates, Inc.

Elwood I. Lentz is named plant manager of concern's phosphate processing plant at Garfield. He was formerly assistant production manager of Stauffer Chemical Co.'s San Francisco division.

U. S. Smelting, Refining and Mining Co.

Boris Ashurkoff, formerly industrial development engineer with company in Salt Lake City, becomes chief mechanical engineer of Western operations. Cyril Heiss is appointed mechanical engineer. He previously held job of assistant mechanical engineer. He succeeds Clyde Craggs, deceased.

WASHINGTON

Pidsweet Foods, Inc.

E. J. Watson rises from position of vice president and general manager to presidency of this Mt. Vernon concern.

General Petroleum Corp.

B. L. Rodzianko is named assistant manager of corporation's Ferndale refinery. He was formerly senior refinery engineer at concern's Torrance, Calif., operation.

Seattle City Light

Paul J. Raver is appointed superintendent of this municipal utility to succeed E. R. Hoffman, retired. He is replaced as director of Bonneville Power Administration by Dr. William A. Pearl, formerly director of Washington State Institute of Technology.

McCall Farm Chemicals, Inc.

Jess W. Lofquist joins firm at Walla Walla as general manager. He was formerly with Simplot Co., Idaho.

Kaiser Aluminum

S. J. Pope is named works engineer at concern's reduction plant, Mead. He was formerly electrical department superintendent there. H. R. Thompson is appointed assistant works engineer; L. A. McCanna, design superintendent; Charles Uhden, electrical superintendent; W. E. Armantrout, potroom superintendent; G. S. Oxrieder, technical assistant to production superintendent; R. A. Rogen and W. E. Barkley, potroom supervisors; John Strinich, technical assistant to potroom superintendent, and Charles Erickson, administrative, metal handling and shipment.

Washington State Power Commission

J. Frank Ward joins commission as managing director. He was previously superintendent of Tacoma City Light.

ASSOCIATIONS ELECT

West Coast Electronic Manufacturers' Assn., Los Angeles Council:

Chairman for 1954, E. P. Gertsch, head of Gertsch Products, Inc.; vice chairman, R. G. Leitner, Packard-Bell Co.; and secretary-treasurer, Gramer Yarbrough, American Microphone Co.

National Constructors Assn.:

President, John F. O'Connell, vice president, Bechtel Corp., San Francisco and New York.

Tile Council of America:

Chairman, Verne Boget, vice president, Gladding, McBean & Co., Los Angeles.

Liquefied Petroleum Gas Assn., Inc.:

West Coast secretary, M. A. Ennis, San Francisco.

Southern California Air Pollution Foundation:

President, Fred D. Fagg, Jr., president of University of Southern California; vice president, Stephen W. Royce, Huntington Hotel president; and treasurer, James Shelton, president of Security-First National Bank.

American Forest Products Industries, Inc.

President, Leonard G. Carpenter, president of McCloud Lumber Co., McCloud, Calif.

Northwest Cannery Assn.:

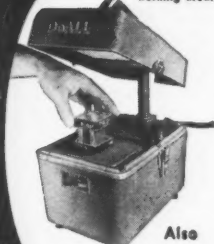
President, Vernon Whitney, Walla Walla Canning Co.; first vice president, Berkeley A. Davis, Rogers Canning Co.; second vice president, Norman Merrill, Blue Lake Packers, Inc.

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West Coast Representative

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TRADE WINDS

News about those who distribute and sell industrial equipment and materials

McDougal advances—Strong retires

Ivan E. McDougal is named manager of Westinghouse Electric Corp.'s office in San Diego. He replaces Ronald T. Strong, who retired January 1 after association with Westinghouse since 1919, interrupted by war service. Mr. Strong is now engineering and sales representative for Electric Supplies Distributing Co., Westinghouse distributor. Mr. McDougal, who joined company in 1936, returned to it after the war as an application engineer in San Diego.

Oregon distributor

Albany Wholesale Supply, Albany, Ore., becomes distributor for Allis-Chalmers motors, controls and transformers in Linn, Lincoln, Lane and Marion counties in Oregon. R. A. Haselton is managing owner of firm, with W. Schantz as general manager and J. Marquis sales manager.

Hercules' Power comes West

W. F. Power is appointed district sales manager, San Francisco, by Hercules Powder Co., Wilmington, Del. He transfers from New York office, where he has been a technical sales representative for past eight years.

He replaces F. H. Crymes, who moves as district sales manager to Chicago.

Baker-Lull in San Francisco

Coast Equipment Co., San Francisco, is appointed distributor in that area for Baker-Lull self-contained materials handling equipment, manufactured by Baker-Lull Corp., Minneapolis, Minn.

New Los Angeles headquarters

Ira G. Perin Co., San Francisco and Los Angeles, moves into new office and warehouse in Los Angeles, at 5422 E. Washington Blvd., which provides space for additional employees and larger stock of equipment and parts.

Transfers to Oakland

A. G. Ricketts, supervisor of sales order department of Rockwell Manufacturing Co.'s Nordstrom Valve division, Pittsburgh, Pa., is transferred to company's plant at Oakland, Calif. In his new position, he will coordinate joint sales planning between Pittsburgh and Oakland plants.

Bulletins from Blackman

Horace Blackman Co., Inc., Los Angeles manufacturer of plastic products, moves into new office adjacent to present plant, which processes Boltaron 6200 and reinforced fiberglass. New fiberglass reinforced plastics and corrosion division has been set up to handle corrosion problems and quote on specific reinforced fiberglass jobs.

Blackman Co., Inc., appoints Holbrook-Merrill Co., San Francisco, as Northern California fabricators of Boltaron 6200 and other corrosion-resistant materials.

Diamond in Bay Area

Diamond Machine Tool Co., Pico, Calif., opens new sales and service office in San Francisco and appoints Henry Dansereau as district manager. He was formerly factory sales engineer for Diamond in Los Angeles area. Company manufactures punch presses, power squaring shears and milling machines.



H. Dansereau
Diamond Machine
Tool Co.



L. E. Andersen
C. A. Norgren Co.

Andersen to represent Norgren

Lester E. Andersen, Portland, is appointed district sales representative in Oregon for C. A. Norgren Co., Englewood, Colo., manufacturer of pneumatic products.

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of premiums
does not insure*

● It is easy to buy fire insurance but difficult to prove a loss.

When fire occurs *you* must be able to prove what you lost and its cash value.

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OFFICES IN PRINCIPAL CITIES

Holmes at helm



George A. Brélie (left), former manager of Oakland office of Ansul Chemical Co., is appointed head of government relations division at firm's home office in Marinette, Wisconsin. He is succeeded by Joseph G. Holmes (right), former manager of Ansul's Los Angeles district office. Company manufactures chemicals for fire equipment, refrigeration and general industry. Oakland office serves Northern California and western Nevada.

Sandblom moves to Sacramento

Robert A. Sandblom transfers from San Francisco to Sacramento sales office of General Electric Co. He joined General Electric in 1946 and has been in San Francisco office since 1951, serving in engineering and industrial divisions.

East Bay warehouse

Adam-Hill Co., San Francisco, opens Oakland office and warehouse to serve customers in East Bay. All Adam-Hill lines of mechanical power transmission products will be stocked and serviced by this new office, which will also carry accommodation stocks of tube fittings. Other areas in Northern California, Nevada and Utah will continue to be served from San Francisco.

Assigned to Billings

Dennis W. Nelson is named sales representative at Billings, Mont., for The Trane Co., La Crosse, Wisc., manufacturer of air conditioning, heating and ventilating equipment.

Heads Pacific Coast division

Frank L. Murphy is appointed manager of National Starch Products Pacific Coast division, San Francisco. He moves west from

Philadelphia, where he has been assistant manager of company's Mid-Atlantic division. He has also been plant superintendent of Montreal and Toronto plants and technical field supervisor of New York division.

FM&C adds cleaner line

Canning Machinery division of Food Machinery and Chemical Corp. is named exclusive distributor of Key Froth Flotation Cleaner in United States, Canada and Hawaiian Islands. Equipment is designed for automatically freeing food products, such as peas and lima beans, of waste material and foreign matter.

Amercon expands service

Amercon Corp., Los Angeles, is appointed exclusive representative for Whiting tram-beam crane and monorail systems in Southern California, Arizona and southern Nevada.

Rapids Standard general manager



C. P. Mears
Rapids Standard Co., Inc., of California



H. A. Bradley

C. Plin Mears, president and general manager of Rapids Standard Co., Inc., of California, San Francisco, resigns to become manager of lumber yards for Taber Lumber Co., Keokuk, Iowa. He is replaced as general manager by Herbert A. Bradley, vice president. Armand Pretot is appointed manager of engineering department, which services the Rapistan Material Flow equipment and Raymond Corp. line of electric and hydraulic fork lift trucks handled by this firm.

Swartwout sales and service

The Swartwout Co., Cleveland, Ohio, begins handling sales and service of its autronic control and power plant equipment through its Los Angeles district office, including spe-

take the back-breaking

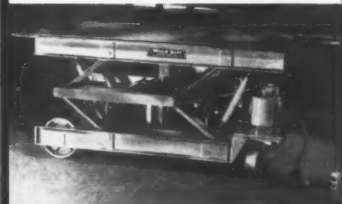
LIFT

out of the Heavy Jobs...

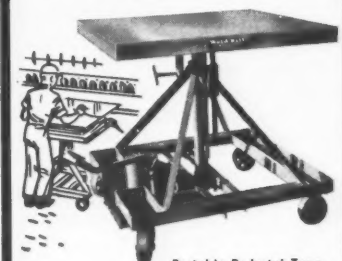
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HYDRAULIC LIFT TABLES



Heavy Duty Table with Electric or Manual Control



Portable Pedestal Type for loads to 2000 lbs.

You don't need "muscle-men" for handling heavy dies, sheet steel, or big machined parts, when you have new WELD-BILT Hydraulic Tables on the job. Just adjust the Table to loading height, slide parts on easily, without tugging or lifting. Then just move to press or machine position, raise or lower to working height—fast, easily.

Heavy duty WELD-BILT Hydraulic Lift Tables, with foot pedal and push button, or foot pump control, handle loads up to 10 tons. Portable Pedestal type Tables handle loads up to 2000 lbs. Write for latest bulletin and prices.

SALES REPRESENTATIVES:

SAN FRANCISCO: Hamerslag Equipment Co., 45 Elmira Street
SAN DIEGO: Myers Equipment Co., 1531 Market St., P. O. Box 337
POMONA: Keville Industrial Service, 1590 Ganesha Place, P. O. Box 1040
PORTLAND: Air Mac, Inc., 1435 S.E. Union Avenue
SEATTLE: Air Mac, Inc., 3838 - 4th Avenue, South
YAKIMA: Air Mac, Inc., 3203 Jefferson Avenue

WEST BEND EQUIPMENT CORPORATION

Materials Handling Engineers
307 Water Street, West Bend, Wis.

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FOOD MACHINERY AND CHEMICAL CORP. John Bean Division - Dept. W1
P. O. Box 145, San Jose 1, Calif.

CLASSIFIED SECTION

Space is sold as advertisers' inches. All advertisements in this section are 1/8 inch short of contracted space to allow for borders and composition. Rates are \$7.50 a column inch. Copy should be sent in by the 25th of preceding month if proofs are required; by the 28th if no proofs are required.

Call King
TU-3176

MATERIAL HANDLING EQUIPMENT

Lift Trucks • Hand Trucks • Conveyors Hoists & Cranes Casters & Wheels

IRVING G. KING & CO. ★ SINCE 1930
821 MATEO ST. L. A. 21

cial accounts formerly handled by Charles P. Crowley. Office, under direction of Roger P. Gilliland, is located at Alhambra, Calif., and will serve Southern California, Arizona, and Clark County, Nev. Gil Moore & Co. are agents for Swartwout's industrial ventilation division.

Polizoto steps up

Joseph L. Polizoto becomes manager of Los Angeles office of E. D. Bullard Co., San Francisco. His association with firm began in 1934, when he started in shipping department, and in 1942 he was appointed assistant manager at Los Angeles. Company manufactures industrial safety equipment for a world market.

West Coast distributor

Industrial Vibrator and Machinery Co., San Francisco, will handle complete line of vibrator equipment, used in moving food, chemicals and other materials, of Cleveland Vibrator Co., Cleveland.

Hammerslag to handle new line

Hammerslag Equipment Co. of San Francisco is named exclusive Northern California distributor for heavy-duty materials handling equipment of Silent Hoist & Crane Co., Brooklyn, N. Y. Territory includes all of California north of San Luis Obispo, Kern and San Bernardino counties.

Add John Gillen line

C. W. Warren Co., Los Angeles, is now handling machine keys, Woodruff keys, taper pins and groove pins manufactured by John Gillen Co. of Cicero, Ill. Territory includes Southern California.

Join Reynolds Aluminum team

Turner Metal Supply Co., Huntington Park, Calif., is appointed a distributor for aluminum products of Reynolds Metals Co., Louisville, Ky. Turner will warehouse specialty aluminum wire and rod and bar (screw machine stock) products.

Oregon, Washington and points north

E. T. Wilson, Jr., Portland, is appointed sales representative of Tubular Products division of The Babcock & Wilcox Co., New York. His territory will include Oregon and Washington. Mr. Wilson was formerly with Cascade Manufacturing Co.

INDUSTRIAL PROPERTY

For Sale Phoenix, Arizona

Covered Steel Shop Bldg. with Crane Runway. Pvd. Pwr. Wiring, 10 ton Bridge Crane. Ideal for Pipe or Steel Fabricating Shop, on 1 Acre of Fenced Property. Near Airport.

Price \$25,000

Write Owner, R. T. DIXON
1625 Naud St., Los Angeles, Calif.

ANODIZING FACILITIES

Full finishing service for aluminum products. Clear Anodize; R-5 Bright Dip; Color Anodizing; Government Specifications; Frankford Arsenal Spec. No. FXS-963 Type B Class 1, 2, & 3.

ALSO DICROMATE SEALING:

Prompt Service from
W. F. HEINE SUPPLY CO.
4015 Adeline St. Oakland 8, Calif.
OLympic 3-5500

INDUSTRIAL CONFERENCE

COMMUNITY industrial development for the West is the topic for a 2½ day conference, June 13-15 at Santa Clara University, for the benefit of local chambers of commerce and planning committees.

R & F CORRECTION

IN THE paint review in the January Review and Forecast Number, estimated output for the eleven Western States for 1950 to 1953 failed to include the final three zeros for each year. Another case of transmittal of figures where dollar volume is given in thousands, without the customary notation of this fact being included.

ON PAGE 30...

... of this issue, the date of the General Motors Motorama showing in San Francisco in the Civic Auditorium was given as March 27 through April 4. The item omitted the fact that the Los Angeles showing will be March 6 through 14 at the Pan-Pacific Auditorium.

President Harlowe Curtice of General Motors will attend these California showings of the Motorama.

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THE West ON ITS WAY

NEW PLANTS, EXPANSIONS, NEW INDUSTRIES, PRODUCTION CONTRACTS,
DEVELOPMENT PROJECTS, UTILIZATION OF RESOURCES

1953 REALIZATIONS . . . 1954 EXPECTATIONS

OUTLOOK UNCERTAIN

According to the first quarter Western business forecast summary published by The Prudential Insurance Co. of America, a small majority of panel members are more optimistic about their own business than they are about Western business in general.

While 56% expect their first quarter 1954 to be as good as or better than a year previous, only 37% have similar feelings about Western business in general. In comparing their expectations for the first quarter with the last quarter of 1953, 55% expect their own business to continue at the same level or above, while only 34% expect as much from Western business as a whole.

Although there is virtually no unanimity of opinion within the various industry groups or from industry to industry, very few panel members indicate extremely optimistic or pessimistic opinions, in contrast to previous forecasts.

Panel members within the trade group were the most optimistic about their business for the first quarter of 1954 while finance and service groups are expecting a down-turn. Examining the seasonal aspect, however, only one group, service, expects its own first quarter of 1954 to be below the fourth of 1953.

NON-AGRICULTURAL EMPLOYMENT

California enjoyed a record employment year in 1953. Every month was higher than the corresponding period of any preceding year, but by a narrowing margin as the year progressed, according to California Labor Statistics Bulletin figures.

At the seasonal peak in September, 4,000,000 wage and salary workers were employed in nonagricultural establishments. Nonfarm employment

averaged 3,895,400 during 1953, 4% above the preceding year and 21% above 1950.

Major industry groups with higher average employment in 1953 than in any previous year were: construction; transportation, communication and utilities; trade; finance; service; and government. Manufacturing, which recorded the most rapid rise since Korea, reached a postwar high in 1953 but failed to match the record established in World War II.

Since 1940, total nonagricultural employment in California has more than doubled. Almost every industry group participated in the growth over the past 13 years and the number employed in construction has almost tripled. The work force in both manufacturing and government is $2\frac{1}{2}$ times that of 1940. Employment in each of the groups—service; trade; finance; and transportation, communication, and utilities—averaged about $\frac{3}{4}$ again higher than in 1940.

MILITARY CONTRACTS

Of the prime military contracts made by the government from July 1950 to September 1953, the West was awarded 17.03%, or a total of \$18,216,312,000.

These figures do not provide definite indication as to where the work covered in the contracts was performed, but in the majority of cases they reflect the location where the product was finally processed and assembled.

The breakdown by states in the West is as follows, in thousands of dollars:

Arizona	\$ 195,393
California	13,364,148
Colorado	184,254
Idaho	49,022
Montana	25,228
New Mexico	83,764
Oregon	264,714
Utah	74,995
Washington	3,928,876

PACIFIC NORTHWEST CONSTRUCTION

December dollar volume of construction in the Pacific Northwest ran 23% behind November to bring the year's building activity to an all-time third place behind 1950 and 1948, according to the statistical department of Equitable Savings and Loan Association of Portland.

The following figures represent Pacific Northwest construction for 1952 and 1953 in combined dollar volume from the 47 largest cities:

State or province	1953	1952
Oregon	\$ 74,696,721	\$ 72,908,516
Washington	118,262,746	121,568,392
Idaho	14,812,376	16,150,417
British Columbia	54,791,846	30,831,315
Total	\$262,563,689	\$241,458,640

INDUSTRY TIES TO RAILROAD

In the nine counties bordering San Francisco Bay, Southern Pacific added 65 new spur-track industrial establishments, or expansions of existing plants, in 1953 to the growing list of diversified industries served by rail.

Although the railroad is moving more products of farms, forests and mines than ever before, the most spectacular gain has been in the "manufactures and miscellaneous" group of commodities. Only 22% of S.P.'s freight tonnage could be so classified 30 years ago. Now that figure has risen to 35%. This would seem to indicate that the West and the Southwest are no longer tied primarily to one major crop or industry and are varying manufacture type and volume.

Since the end of the war the railroad has acquired 38,500 new freight cars and has more than 2,000 others on order. It took delivery of approximately 6,700 new cars in 1953 and more than half the freight car fleet is now made up of these postwar cars.

ALASKA

TO START IN MID-YEAR—Ketchikan Pulp Co., Ketchikan, will begin operation about April of its pulp mill now nearing completion. Puget Sound Pulp & Timber Co. and American Viscose Corp. are jointly building the new \$45,000,000 pulp and paper mill, which will use timber from Tongass National Forest.

JAPANESE PULP MILL—Alaska Pulp & Lumber Co. is incorporated in Juneau by Japanese interests for proposed pulp and sawmill operation, which may be located at Sitka. Proposal is still in exploratory stage.

ARIZONA

DUCOMMUN ADDS—Ducommun Metals & Supply Co., Los Angeles, acquires inventory, equipment and organization of Industrial Supply Co., Phoenix, an affiliate of Rawlins Bros., Inc., of Los Angeles.

CLOUD STUDY—University of Arizona is given \$150,000 grant by Alfred P. Sloan Foundation, Inc., New York, to establish institute for study of upper atmosphere and solar energy, including cloud and thunderstorm research.

MILL EXPANSION—Southwest Lumber Mills, Inc., Flagstaff, plans \$1,000,000 expansion to cover construction of new planing mill, box factory and dry kilns adjoining its present sawmill, which will be modernized. Company has also purchased Arizona Lumber & Timber Co. sawmill in Flagstaff.

LIQUID OXYGEN—Dye Oxygen Co., Phoenix, will add 50,000 sq. ft. of space to its plant facilities and install equipment for manufacture of liquid oxygen.

TUCSON FIRMS MERGE—Boeckeler Instrument Co. merges with Arizona Tool & Die Co., Tucson, for manufacture of precision instruments used in tool and electronics industries.

PROVING GROUND FOR FORDS—Ford Motor Co. plans to buy about 4,000 acres in Mojave County and build testing facilities for Ford vehicles, to replace company's Phoenix test station, which has conducted its testing on public highways.

CITRUS PACKING PLANT—Arizona Citrus Growers Assn. will build \$350,000 packing plant in Phoenix, planned for full operation by September 15. Association markets its fruit through Sun-kist Growers, Inc.

MINE REHABILITATION—Newmont Development Co. begins pumping operations to lift water from Westside shaft of lead and silver mine at Tombstone. Mine has been flooded since mid-1880's. Newmont is a wholly-owned subsidiary of Newmont Mining Corp., New York.

TO PIPE RAW CEMENT—Former Phelps Dodge smelter property at Clarkdale is purchased by Erle P. Halliburton, of Oklahoma and Texas, for conversion to cement-making operations. New company to be organized for Arizona operations will begin production within a

year. Raw-cement product will be moved by gravity through a 5-in. pipeline from Clarkdale to Phoenix for final processing. Halliburton is associated with Halliburton Portland Cement Co. and Halliburton Oil Well Cementing Co.

MOVE TO HUACHUCA—Army transfers electronic proving activities from Fort Monmouth, N. J., to Fort Huachuca. Operations may eventually employ up to 8,500 persons, with payroll of \$9,500,000.

TELEPHONE PROGRAM—Mountain States Telephone and Telegram Co. plans \$12,100,000 program for improving facilities and service in Arizona.

MEDICAL INSTRUMENTS LAB—Dr. Arthur E. Engelder sets up research laboratory in Douglas for development and manufacture of medical instruments.

EXPAND AT HUGHES—Assembly and storage facilities for explosives will be built at Hughes Aircraft Co.'s Tucson plant by Air Materiel Command, at a cost not to exceed \$2,400,000.

MILK PLANT CHANGES HANDS—Arden Farms Co., ice cream manufacturer and distributor in Arizona, California, Washington and Oregon, buys Borden Milk Co.'s evaporated milk plant at Tempe.

BATTERY ENTERPRISE—New industry, manufacture of wet-cell storage batteries, begins in Phoenix with opening of Nolin Co., Inc., plant. Plant capacity is 6,000 batteries monthly.

CALIFORNIA

BUY TOBEY—Magnesium Co. of America, East Chicago, Ind., acquires Tobey Manufacturing Corp. of El Segundo, manufacturer of aluminum materials handling equipment, and will operate firm as Tobey Aluminum division of MAGCOA.

NEW FLEET FOR P-I-E—Pacific Inter-mountain Express, Oakland, places \$4,000,000 orders for trailers, covering 370 regular closed van type and 106

mechanically refrigerated type. Fruehauf Trailer Co., Detroit, will build 303 units, Brown Trailers, Inc., Spokane, 150, and the Strick Co., Philadelphia, 23. Delivery will be completed within five months.

SOLAR SYSTEM EXPANDS—Solar Steel Corp., national steel warehousing firm with headquarters in Cleveland, acquires steel warehousing operations of Rawlins Bros., Inc., Los Angeles, and plans new office building and plant improvements. Rawlins Bros. will continue hardware supply business under same name.

NEW PLANT AND NEW PLANS—Crown Zellerbach Corp. opens new paper converting and citrus wrap print plant in central manufacturing district of Los Angeles, and buys 42-acre site for new paper mill in East Antioch.

TEXTRON BUYS DALMO VICTOR—Textron Incorporated, textile manufacturer with head office in Providence, R. I., buys all stock of Dalmo Victor Co., Los Angeles producer of radar antenna systems and other precision electro-mechanical equipment.

LUMBER MILL SOLD—Wilson and Beedy Mill at Branscomb is purchased by Vern Jack, manager of company, and will operate under new name of Vern Jack Lumber Co.

WILL SHARE PLANT—Construction begins on \$4,500,000 plant in San Leandro to be built and operated jointly by Western Electric Co. and Pacific Telephone & Telegraph Co. Facilities for Western Electric, to cost about \$3,500,000, will be used as distributing house; those of PT&T, costing \$1,000,000, as a supply center.

NORTHROP LICENSE—E. H. Stau Co. of Los Angeles is given exclusive license to manufacture and market a Northrop-developed cable slack compensator, used to eliminate slack in aircraft control system cables.

CLOVERDALE MILLS—Sonoma Plywood Co. will build veneer mill near Cloverdale. Cloverdale Timber Co., new firm organized by Molalla Forest Products Co., Molalla, Ore. and Bates Tim-

NEW QUARTERS FOR HYSTER—Building recently completed for Hyster Co., in central manufacturing district of Los Angeles, provides air-conditioned display rooms, ample customer parking space, and 9,000 sq. ft. for parts and repair facilities. Total building area is 14,451 sq. ft. Hyster Co. manufactures and distributes materials handling equipment.



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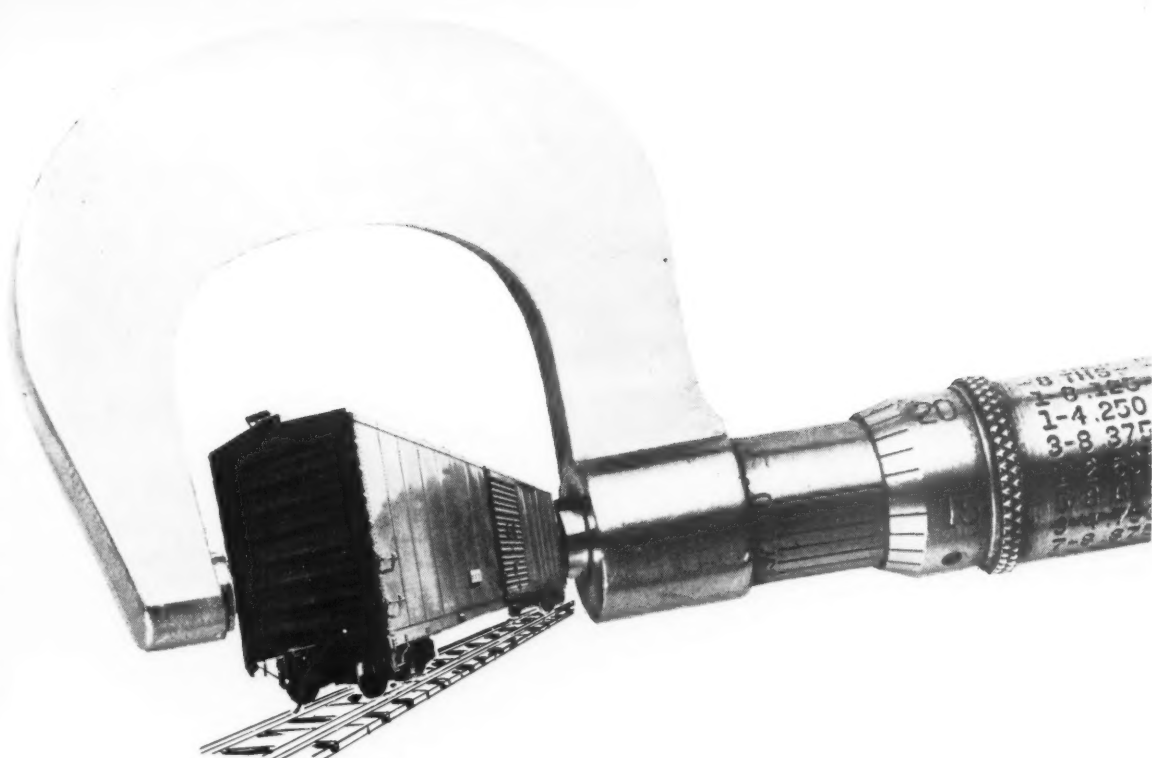
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A "HEAVY-DUTY" FREIGHT SERVICE ... machined to Western specifications

National's expedited freight service is virtually custom made to meet the needs of Western industry. An increasing number of industrial shippers are finding that National Carloading's "all-service" shipping has simplified their transportation, particularly on the long haul cross-country.

Look at the facts. By shipping via National, you get a complete one-company service for your less-than-carload freight, for your export-import and for shipments of household goods and autos of your company personnel — origin to destination.

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DISTRICT OFFICE: 354 South Spring Street, Los Angeles, Calif., TRINITY 8421 • DISTRICT OFFICE: 1326 Fifth Avenue, Seattle, Wash., MUTUAL 1490

The Lufkin Line



Vic Fascetti

COON HUNTING IN EAST TEXAS

It was a little after high noon in Lufkin on Sunday, January 3rd, when our train, the "Cleveland" pulled into the depot—a red brick one, New Year's Day, just 42 hours before, Al McConville, Bob Spaulding and I had boarded the Sunset Ltd. in L. A.

Vice President Ed Trout was there to meet our "Piney Woods Special" and it was good to be back for another visit to the land of Southern Hospitality—and the home of Lufkin Pumping Units, Gear Reducers and Gas Engines.

Lufkin peddlers seemed to be arriving from all corners of the globe—Canada, Casper, California, Corpus Christi, Kilgore, Tulsa, Dallas, Houston, New York and even South America. We gather here about this time each year to attend and participate in the Company's Annual Sales Conference—a very enlightening, stimulating and educational experience.

Not the least of this education was a hunting trip—an extra curricular activity which Ed Trout arranged—an *East Texas Coon Hunt*. This is one of those nocturnal sports where you don't get started till 9 or 10 P.M. and you come on home hours later after tracking and treeing one or more coons—it may be days later if you lose your compass—or fail to navigate. Deep in the heart of these woods one pine tree looks much like another.

A small party headed by Woodsman E. P. Trout entered the forest equipped with Beagles (dogs) and Pointers, two native yardmen, flashlights, lanterns, compasses and a flask or two of neutral spirits for coon hunters with cold feet.

Ed, a seasoned Coon Hunter, threw all the coons in the forest into utter confusion by bringing his "goose call"—in our haste to get on with the hunt, Ed mistook this duck hunter's gadget for the "coon call." This, however, only added to the fun of the occasion, we caught coons and the "goose call" provided many a laugh.

Reluctantly, we had to get ready to go home—it was now a week later and the Sales Meeting was successfully concluded. Boy, did we work!

P. S. Thanks to all of our good friends and customers for making 1953 another great year. And if you are ever in the vicinity of Lufkin it would be a pleasure for us to take you on a "Coon Hunt."

Vic Fascetti

LUFKIN FOUNDRY & MACHINE CO.

PACIFIC COAST DIVISION

5959 S. Alameda St., Los Angeles 1, Calif.
Dallas Lufkin, Texas New York



VENTILATOR FACTORY—G. C. Breidert Co., Los Angeles, moves into new building in Pacoima, with five times its former manufacturing area. Firm manufactures ventilating equipment used for industrial buildings, residences, ships, and other purposes.

ber Co., North Plains, Ore., will cut and mill redwood, Douglas fir and sugar pine.

ROCKET ENGINE ORDER—Ryan Aeronautical Co., San Diego, receives contract for more than \$1,000,000 to build rocket engines for Firestone Tire & Rubber Co., Los Angeles.

FROM PLANT TO WAREHOUSE—Hunt Foods, Inc., will convert its cannery at Campbell to a warehouse, as a result of increases in production efficiency and capacity at its Hayward and Fullerton canning plants.

JUNIOR-SIZED ACCELERATORS—"Toned-down" electron linear accelerators similar to Stanford University's billion-volt 200-ft.-long model will be manufactured and sold by X-ray Department of General Electric Co. under a 10-year agreement with the University, for use in cancer therapy and inspection of industrial products.

STANFORD RESEARCH—Heat and Mechanics Section is set up by Stanford Research Institute within its Physics Department, to undertake research in applied mechanics, combustion, heat transfer, thermodynamics and allied fields. Head of new section is J. Kenneth Salisbury, formerly manager of thermal power systems division of General Electric Co.

CHICO FIRM BOOMING—Chico Portable Cooler and Heater Co., which moved in September into new 11,000-sq. ft. plant, plans \$1,000,000 production of air coolers for 1954. New plant consolidates operations previously housed in seven separate buildings at Chico municipal airport.

MUST MOVE—Fleishacker Paper Box Co. will move its San Francisco plant, to make way for new freeway construction, to San Leandro, where \$750,000 plant will get under way soon.

AMMONIA DIVISION FOR SHELL—Following opening of its ammonia plant at Ventura, Shell Chemical Corp. forms ammonia division with headquarters in San Francisco, to handle manufacture, distribution and sale of chemical.

COLONIAL BROACH IN WEST—Colonial Broach Co., Detroit, sets up West Coast manufacturing affiliate, known as Colonial Western Broach Co., in cooperation with Demco Tool Co., Inc., Los Angeles, sales representative for new firm and parent company.

ULTRA-VIOLET EXPANDS—Ultra-Violet Products, Inc., South Pasadena,

completes 10,000-sq. ft. addition, to house expanded research laboratory and increased production facilities for industrial inspection lamps.

TO DOUBLE CAPACITY—Standard Steel Spring Division of Rockwell Spring & Axle Co., Los Angeles, will build \$600,000 addition to its plant, with an anticipated doubling of manufacturing capacity and personnel.

LAMPSHADES IN WEST—Vedplex Co. of Essex, Conn., lamp manufacturer, plans to open West Coast branch factory in Pasadena early this year. Initial production will be lampshades.

MISSION FURNITURE EXPANDS—Mission Furniture Manufacturing Co., Los Angeles, moves into leased 50,000 sq. ft. plant, more than three times size of vacated quarters.

ADD GARDEN FURNITURE—Certified Chrome Furniture Co. of El Segundo, Calif., manufacturer of dinette sets, will expand into production of aluminum garden furniture this year.

JET REPAIR CONTRACT—North American Aviation, Inc., is awarded \$2,000,000 contract for "inspection and repair as necessary" of 25 Air Force F-86 Sabre Jets, to be performed by its Fresno division.

MAY MERGE—Golden State Co., Ltd., and Foremost Dairies, Inc., will seek approval of stockholders for merger of two companies. Companies will continue separate operations after merger.

INCORPORATE—Craft Shop, San Diego partnership, reorganizes as corporation with new name of Hammond Machinery & Supply Co.

EXPAND AT ANAHEIM—Robertshaw-Fulton Controls Co. begins \$500,000 addition to its Anaheim division plant.

BOX FIRM TO BE SOLD—Angelus Paperbox Co., Los Angeles, will be purchased by Robert Gair Co., Inc., New York, early this year.

GLOBE-UNION BUILDS—Globe-Union, Inc., Milwaukee manufacturer of batteries, electronic items and radio parts, will build plant during 1954 on six acres recently purchased in Milpitas area, near San Jose.

ACQUIRE WESTERN PLANT—American District Steam Co., Inc., of North Tonawanda, N. Y., acquires California Steel Products Co., Richmond, for operation as its Western division plant.

FIGHT SMOG—Richfield Oil Corp. plans to install air pollution control facilities costing \$1,680,000 within next 15 months at its Los Angeles Basin refinery and storage areas. Company's total investment in anti-smog campaign since World War II has now reached \$3,000,000.

COLORADO

ARVADA ELECTRIC SOLD—Arvada Electric Co., utility firm serving Arvada area near Denver, is purchased by Public Service Co. of Denver.

TOLL TUNNEL SITE—Engineers employed by State Legislature to study pro-

posals for tunnel through Colorado mountains recommend Straight Creek site north of present Loveland Pass road. Tunnel's estimated cost is \$15,000,000. Studies were made by Howard, Needles, Tammen & Bergendoff of Kansas City, together with Ole Singstad, New York tunnel expert.

BEARING PLANT—New plant will open in Colorado Springs by June 1 for production of oilless bearings for cars, home appliances and aircraft, owned and operated by International Powder Metallurgy Co., Ridgeway, Pa.

MARKET TV AERIAL DISCOVERY—Denver Plastics, Inc., Golden plastics firm organized three years ago, begins sale of novel television aerial the size of a dollar, which reportedly replaces inside or outside aerial installations.

40 ACRES FOR A WELL—Colorado Oil and Gas Conservation Commission issues regulation providing for 40-acre spacing of oil wells in recently discovered Adena reserves, Morgan County. Gas wells will be spotted one to every 160 acres.

DENVER UNIT GROWS—Continental Can Co. plans \$500,000 expansion program at its Denver plant, with resulting increase in production of 150,000,000 metal containers annually.

WIN GOVERNMENT CONTRACT—Broadway Auto Top Manufacturing Co., Denver, is awarded \$55,580 Army contract for production of 14,000 flexible windows for army tents, after survey and recommendation of firm's competency by Small Business Administration.

TO TEST AIRDOCK—United Air Lines is building full-scale model of an "Airdock" for loading and unloading aircraft at Denver's Stapleton airfield, to be completed in March. Facilities include mail, cargo and baggage work center, aircraft cargo pits, conveyor belt, overwing fueling booms, airplane positioning rig and passenger bridge.

URANIUM LEASE—Hunt Oil Co., Dallas, Tex., leases 5,200-acre uranium tract at Telluride and plans \$250,000 drilling operation in area.

OIL COMPANY MERGER—Stockholders of Holly Oil Co. and Table Mesa Oil Co. approve merger, to be accomplished by issuing Holly stock in exchange for each six shares of Table Mesa stock.

IDAHO

LEWISTON GETS DRYDOCK—Steel drydock manufactured by Inland Navigation Co., The Dalles, Ore., is put into place along Snake River at Lewiston.

BUILD FOUNDRY AT BOISE—Construction will be completed by March on 7,700-sq. ft. concrete-block plant for housing both a foundry operated by Boise Iron Works and machine shop facilities of Yanke Machine Shop, Inc., Boise.

NEW AIRPORTS—Owyhee County will construct community radio at Triangle airstrip to provide emergency communication for ranchers in area. County also plans to participate with state in build-

ing air port facilities at Murphy, Bruneau, Mud Flats and Oreana. Towns of Homedale and Marsing will build their own airstrips.

SINCLAIR EXPANDS—Sinclair Refining Co. acquires over 20 bulk plants and 60 service stations in southern Idaho in purchase from Fletcher Oil Co., at a price reportedly over \$3,500,000.

RARE EARTH DISCOVERY—Monazite deposit is reported in Lemhi County of central Idaho, where Molybdenum Corp. of America has leased claims. Monazite is a source of radioactive thorium and rare earth elements.

MONSANTO AWARDS CONTRACT—Contract in amount of approximately \$1,000,000 for constructing second electric furnace at Soda Springs is awarded to Wigton-Abbott Corp., Plainfield, N. J., by Monsanto Chemical Co. Construction will begin this month and is to be completed in fall.

BOEING SCOUTS—Representatives of Boeing Aircraft Corp. of Seattle inspect tools and facilities of Pocatello Naval Ordnance plant, reportedly with an eye to possible availability of plant equipment in event of Navy cutbacks.

NEW SIMPLOT PLANT—J. R. Simplot Co., Boise, will build liquid nitrogen fertilizer plant in Lewiston, to begin operations in March.

MONTANA

YELLOWSTONE LINE—Continental Pipe Line Co. completes 125 mi. of its 537-mi. Yellowstone line from Billings to Spokane, Wash. Ten-inch petroleum pipeline is scheduled for completion in September, at total estimated cost of \$20,500,000.

SELL GAS HOLDINGS—Transmission lines and gas reserves in Great Falls-Havre area of Montana are sold by Montana-Dakota Utilities Co., Minneapolis, to Montana Power Co., Butte, for a sale price of about \$6,500,000. Montana-Dakota also contracts to sell natural gas from new reserves in Wyoming to Montana Power.

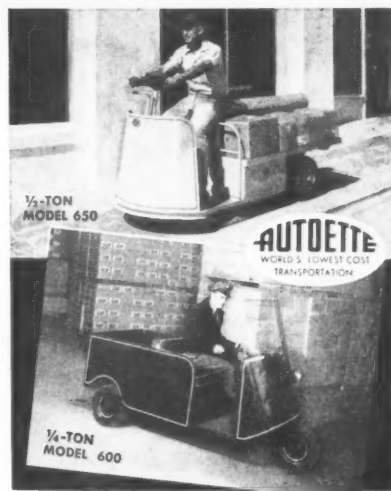
NEW MEXICO

SAWMILL FIRE—Fire destroys boiler building of Navajo sawmill east of Canyon de Chelly, with estimated loss of \$200,000.

OREGON

BUILD MILK PLANT—Lucerne Milk Co. division of Safeway Stores will build \$500,000 fluid milk plant in Milwaukie on land acquired from Bayly Manufacturing Co.

WILL STUDY CINDERS—Associated Forest Industries of Oregon, in cooperation with state air pollution authority, will carry out a survey on methods of reducing cinder emission from sawmill



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refuse burners. West Coast Lumbermen's, Western Pine, and Western Forest Industries associations will also participate.

UTILITIES MERGE—Mountain States Power Co., Albany, will merge with Pacific Power & Light Co., Portland, in stock exchange plan, subject to approval of stockholders and state and federal regulatory commissions.

VENEER COMPANY SALE—Western Veneer Co., Lebanon, is acquired by Western Veneer & Plywood Co. Purchased plant has capacity of about 4,000,000 sq. ft. of plywood a month.

TRUCKING TERMINAL—Consolidated Freightways, Inc., awards \$64,717 contract to Todd Building Co., Roseburg, for construction of new freight terminal in Roseburg.

CRAB PACKING—Keystone Packing Co., Ilwaco, begins packing crab meat, using crabs brought by truck from Grays Harbor.

BUY BEETLE-KILLED PINE—Tite Knot Pine Mill, Redmond, buys 450,000 bd. ft. of beetle-infested ponderosa pine, in sealed-bid sale, at \$2 per thousand.

END OF PERLITE PLANT—Machinery, equipment and rolling stock at Dant & Russell perlite plant, Maupin, is sold to L. E. Herron of Portland, doing business as Sunset Equipment Co. Plant until recently was leased to Kaiser Gypsum, which did not renew contract.

STORE GRAIN IN SHIPS—Mothball cargo fleet at Tongue Point and in Puget Sound may be used for storing 20,000,000 to 25,000,000 bushels of surplus wheat, dependent upon approval of Department of Army. Use of the idle ships was recommended in December by Oregon Wheat Growers league.

SMELTER PROJECT—Group of Medford businessmen reportedly are considering establishment of an electric smelter in White City area north of Medford, and Jackson County chapter of Western Mining Council is soliciting ore samples from area to determine adequacy of local ore deposits.

CATHODE RAY TUBES—Tektronix Inc., Portland, in a \$200,000 expansion, adds 18,200-sq. ft. cathode ray tube plant. Company previously purchased tubes needed for production of oscilloscopes.

FLAX PLANT CLOSES—St. Paul Flax Growers Association closes its plant in the Willamette Valley.

PORT SURVEY—Portland Commission of Public Docks employs Tudor Engineering Co. of San Francisco to survey commission's proposals for dock improvement and check estimates of costs. Report of engineering firm will serve as basis for requested bond issue.

UTAH

TAKE OVER COBALT PLANT—Chemical Construction Corp., subsidiary of American Cyanamid Co., is awarded a two-year contract to manage and operate cobalt refining plant of Calera Mining Co., a subsidiary of Howe

Sound Co. Plant, at Garfield, has been in partial production since late 1952. Purpose of contract is to enable Chemico, which designed and constructed plant, to place operation on a successful commercial basis. Cobalt concentrate is supplied by Calera from its mill at Blackbird Mine in Idaho.

MINE OPERATIONS JOINED—Independent Coal and Coke Co. consolidates operations of its Castlegate and Kennilworth coal mines in Carbon County, reducing work force at Castlegate by 60% and cutting production there from 2,500 tons to 800 tons daily. Employment at Kennilworth will be increased and production raised 2,500 to 3,500 tons daily.

IN OPERATION—Phosphate fertilizer plant of Western Phosphates, Inc., at Garfield begins full-scale production. Initial capacity is 92,000 tons annually.

PLANT REMODELING—Regal Ice Cream Co., Salt Lake City, plans \$60,000 expansion and renovation of its facilities.

HOMESTAKE-LITTLE BEAVER—Homestake Mining Co. enters \$1,560,000 agreement for development of Little Beaver Mining Co. uranium claims in San Juan County, Utah. Homestake is nation's largest gold producer.

FRAZER-STEEN—Joseph V. Frazer, former chairman of board of Kaiser-Frazer Corp., purchases sixteen uranium claims near Moab held by Charles L. Steen, president of Utex Exploration Co. Standard Uranium Corp. is formed to develop claims, which sold for about \$2,000,000. Property adjoins Mi Vida mine owned by Steen.

CLOSE URANIUM PILOT PLANT—Vanadium Corp. of America closes its experimental pilot plant at White Canyon, near Hite, Utah, which processed copper uranium ore, and terminates contract with Atomic Energy Commission.

POWER PROPOSAL—Private power companies in Rocky Mountain region propose to Interior Committee of House of Representatives that their transmission systems be used to deliver electricity to REA cooperatives and other customers from planned government dams on Colorado River.

WASHINGTON

SIMPLIST STARTS PLANT—J. R. Simplot Co., Boise, begins work on new fertilizer plant and distribution center in Walla Walla, scheduled for operation by March. Contractor is Don Flemming, Walla Walla. In addition to liquid fertilizer, plant will manufacture applicator units for farm equipment.

KAISER AWARDS CONTRACT—J. C. Boespflug Construction Co. of Seattle receives contract to build Kaiser Gypsum Co.'s new board plant and plaster mill, with low bid of \$1,709,762. Eight major structures are planned, as well as storage and pier facilities, at an overall cost of \$4,000,000.

AMMONIA BY BARGE—Shell Oil Co. is working on plans to ship anhydrous ammonia in bulk from its plant at Pittsburg, Calif., over a 900-mi. ocean and

river route to storage terminals at Portland, Ore., and Pasco, Wash. Barge dock and two storage spheres with over 2,000 tons capacity will be constructed at Pasco by Tidewater-Shaver Barge Co., Portland, for lease to Shell. At Portland a spherical storage tank of 2,700-ton capacity will be erected. An ocean-going barge of 1,680 tons capacity will be specially designed for transporting liquid ammonia under pressure from Pittsburg to Portland on a regular schedule.

BUY PACKING PLANT—Hygrade Food Products, Detroit, Mich., acquires Carstens Packing Co. of Tacoma, at a reported price of \$3,500,000.

ATOMIC HEATING PLANT—General Electric Co., Hanford, works on design of plant to utilize waste heat for space heating. Cost of heating plant would exceed that of steam system, but savings in fuel bills would in estimated 7 to 8 years repay cost.

TO BUILD GRAIN ELEVATOR—Almira Grain Growers, Inc., engages Larson-Bradshaw, Inc., Spokane, to build 376,800-bushel grain elevator at Hanson station, outside Almira, at a cost of \$150,000. New unit will adjoin company's present elevator at station.

TO ADD 500 EMPLOYEES—Aluminum Co. of America will employ another 500 persons in the state of Washington during 1954, in its new extrusion mill and cable plant addition now near completion at Vancouver and its reduction plant near Wenatchee.

U. S. MILLWORK BOOMS—United States Millwork Corp. plans to buy equipment of Burke Millwork Co., Seattle. Company also plans to establish new plywood finishing plant in Seattle, to be supplied with green peeled veneer processed at plant to be built on Kuiu Island, Alaska, where company has 20,000,000 ft. of timber under contract. Other acquisitions planned include Burke Machinery Co., some of assets of Fremont Dock Co. and Detail Millwork Co., all of Seattle, and former Cruver Door Co. plant at Anacortes.

BOEING PURCHASE—Boeing Airplane Co., Seattle, will buy former Dennison food plant, containing 28,242 sq. ft. of floor space, for use as a plastics shop.

ALL-ELECTRIC SAWMILL—R. J. Ullman Co. begins construction of sawmill at Cosmopolis, to be opened within six months, designed for all-electric operations.

GRAPE JUICE STORAGE—Welch Grape Juice Co. will enlarge tank storage at its Kennewick and Grandview plants, in a \$758,000 expansion program.

FREEZING PLANT SOLD—Fisher & Son buy freezer plant formerly owned by E. A. Brock & Son, Puyallup. Manager of new firm is L. Donald Fisher.

LEASE AIRPORT SPACE—Lyle Neff, Pasco, owner of Agriform chemical fertilizer concern, leases underground storage space at Walla Walla city-county airport, and plans to build liquid mixing plant this year.

MERGER APPROVED—U. S. Securities and Exchange Commission approves sale of stock of Consolidated Gas Co. to



SEATTLE ELECTRONICS PLANT—Two-story wing at left of this new building under construction for United Control Corp., Seattle, is finished and already in use, housing firm's engineering department, offices and machine shop. Building when completed in late 1954 will provide 40,000 sq. ft. of production and laboratory space and will cost an estimated \$250,000. Increased space will permit firm, now producing electronic equipment for aircraft industry, to branch out into other fields, such as pulp, plywood, paper and petro-chemical manufacturing.

effect its proposed merger with Bellingham Gas Co., Bremerton Gas Co., Wenatchee Gas Co., and Northwest Cities Gas Co. New corporation would be named Cascade Natural Gas Corp., with Stewart Matthews as president.

CORN CANNERY CLOSES—Green Giant Co. closes its Ellensburg corn cannery which it took over from Pictsweet in 1949.

DAIRIES MERGE—Meadowmoor Dairy and Blue Bell Dairy merge their interests in Wenatchee area with Arden Farms Co., and will operate under name of Arden Farms.

FREIGHT LINE TO ALASKA—Arctic Freightways, Inc., is organized in Seattle

to provide motor-freight service between Seattle and Alaska cities under Interstate Commerce Commission certification.

ORE EXPLORATION—Backed by loan from Defense Materials Exploration Administration, Howe Sound Co. and its subsidiary, Calera Mining Co., will undertake exploration projects for copper and cobalt at Holden, Wash., and Lemhi County, Idaho.

N. P. PLANS FREIGHT YARD—Northern Pacific Railway will carry out \$5,000,000 freight yard program at Pasco, scheduled for completion in early 1955. Three connecting yards will be four miles long and contain 50 mi. of track.

WYOMING

PIPELINE FOR LAKE CREEK—Texas Pipeline Co. of Houston, Tex., applies to Wyoming Public Service Commission for approval to buy existing 6-in. pipeline running through Lake Creek field and construct additional line and storage facilities, which will give field its first pipeline outlet. Existing line, owned by Texas Co., parent company of Texas Pipeline, runs from Black Mountain oil field to Kirby Creek station.

INDUSTRIAL SURVEY—Wyoming Industrial Research Council, Laramie, will sponsor a comprehensive industrial survey of southwestern Wyoming, to be carried out by Floyd K. Harmston of Laramie under direction of Dean M. Clare Mundell of University of Wyoming. Survey will be supported by grants from Greater Wyoming Committee and a group of private companies.

BUY REFINERY—Sioux Oil Co., Newcastle, acquires Co-operative Refinery Assn. refinery in same city.

CONOCO OIL PURCHASE—Continental Oil Co., Denver, buys major interest in Bonanza oil field, Wyoming, from Poppy Oil Co., Dallas, Tex.

SHIP ALUMINA—Bureau of Mines ships first batch of alumina produced at Laramie plant, which was placed in operation six months ago, to an Oregon metallurgical concern. Eighty-ton shipment was valued at \$2,700.

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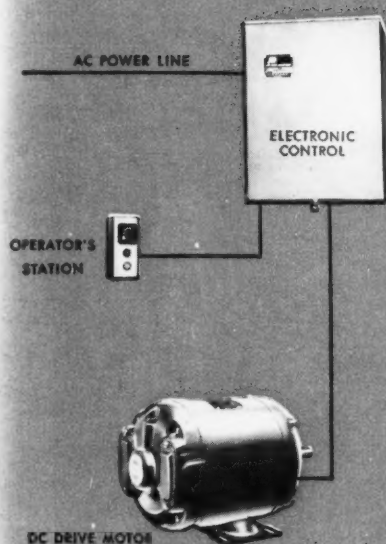
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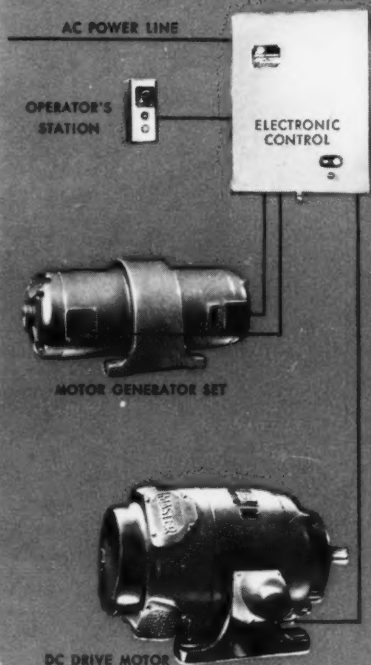
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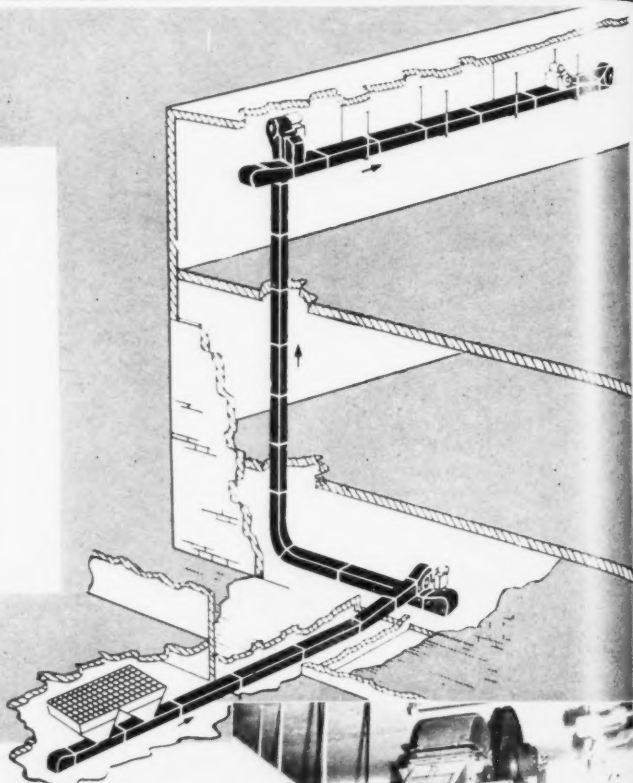
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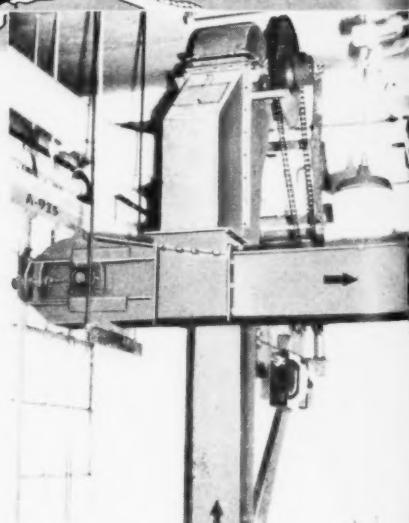
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